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**EDWARD H. TAYLOR: RECOLLECTIONS OF
AN HERPETOLOGIST**

NOTE: The map depicting part of the Philippine region, reproduced on the cover, was used by Edward H. Taylor in the course of field work in 1912-1913.



EDWARD H. TAYLOR

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AN HERPETOLOGIST

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PREFACE

The charge to anyone doing a volume like this is complex and best met by artists, not scientists. Professor E. H. Taylor is now 86 years old and has been busy for all that time. How, short of a full biography, can we recreate in our minds the sense of and feeling for this energetic, creative, sometimes irascible man who has had an extraordinary career as naturalist, explorer, teacher, friend (especially of children), scientist, spy, consort of royalty and "father" of modern herpetology? This book senses the man only fractionally and certainly less than we expect for average persons. But this is as Professor Taylor wishes it, and his full story may never be told.

This volume about Professor Taylor has had a mixed ancestry. In part, it began two or three years ago as a devoted effort to honor Professor Taylor. The original thought was that some kind of festschrift would be appropriate, pulling together a number of separate and independent scientific contributions in a traditional tribute to this great man. While this idea lurked restlessly in the backs of our minds, Professor Taylor's own efforts came to our attention and resulted in the creation of an autobiographical fragment, which has become the heart of the present volume. This section had its inception in a delightful series of radio programs presented by KFKU, K.U.'s own radio station, some 43 years ago. For the most part, these programs dealt with Professor Taylor's experiences in the Philippine Islands and were directed toward young people.

Professor Taylor's many friends in the Museum of Natural History (and elsewhere) have encouraged him in his autobiographical efforts—and these continue. Professor Taylor has agreed to let us publish the memoir concerning the Philippines, and we are grateful to him for the opportunity. Thus, instead of a festschrift, we have a work about Professor Taylor. Other parts of the volume concern Professor Taylor's contributions as a teacher, his publications, and a summary or appreciation of his career as a scientist.

We are indebted to many for making this book possible. Obviously, without Professor Taylor's own contribution the book would have been entirely different. Many persons assisted in a wide variety of ways in the preparation of the various contributions: in addition to the authors, these include Professor and Mrs. Kraig Adler, Ms. Marlene Orr, Professor William E. Duellman, Professor Howard K. Gloyd, Mr. Joseph T. Collins, and Dr. Stephen R. Edwards. To all of these we are grateful for their devoted tribute to Ed Taylor.

PHILIP S. HUMPHREY
RICHARD F. JOHNSTON
19 June 1975

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I
PHILIPPINE ADVENTURES:
AN AUTOBIOGRAPHICAL MEMOIR

By
EDWARD H. TAYLOR

I. I ARRIVE ON STAGE

It may be more scientific to begin a story at its beginning, but one can be literary even if one begins at the end. I shall choose a course somewhere in between and begin at my arrival rather than at the start of my journey.

There was little remarkable about my arrival since it followed the usual pattern of occurring at a very early age. Both my parents apparently were aware of my intent to come, on or about April 23 in 1889, since both were on hand to give me a cordial welcome on that date. But alas, planned parenthood carries no guarantee of satisfaction, and I was not the invited girl. I refused to be anything but a boy. I recognized them as my lawful parents and began communications with a squall at one end fostered by uncertainty at the other. Although it is quite possible my parents regretted the result of their planning, I felt perfectly contented with the outcome. They certainly were not bad parents, a fact that becomes so evident at this late moment when, on the authority of many youths and maidens of the 1970's, parents have deteriorated terrifically; in fact, many children can't even be certain who fathered them.

The household into which I arrived was of mixed composition and consisted of brother Eugene, six years old; a cousin Anna, twelve; a grandmother, eighty; and an uncle, Alex (whose fiancée had recently died). And of course, my father and mother, George and Loretta.

Our household was a distillation of the larger Taylor clan that, apparently, had all migrated from Ohio shortly after the unpleasantness of the 1860s. The family then consisted of two married daughters, Phoebe E. Beatty and Sophia Jane Faucett—along with their families—and sons Robert, George (my father), Thomas R., and Alexander. They left behind the graves of six other children: Edward H. and William, who were lost in the Civil War; Silvania, the firstborn, Fletcher, David, and Martha.

If this was planned parenthood, Grandfather evidently was superstitious since Alex was, as far as we know, number twelve and he lived to see his eightieth year. (One might remark that

the theory of zero population growth was not prevalent from the 1830s to the 1850s.)

Perhaps to accompany this bit of family history, I should present some idea of the local environment. The house in Maysville, Missouri had very ample surroundings, perhaps a block square, with garden space, a croquet ground, an icehouse, a smokehouse, and what are, perhaps, now called comfort stations. Directly across the street were buildings, stables, grain bins and the like. And immediately west of the house and its environs were fields and a splendid orchard. Occupying a lot to the north was our nearest neighbor Zack Savage, and across the street from him was a Mr. Ransome. This area might be regarded as my early home range.

The house had been built by Grandfather and it incorporated part of an old semi-log house that contained a large fireplace in which 6-foot logs could be accommodated and where a great copper kettle might spread the rich aroma of boiling apple butter. This was our living room. A kitchen and a parlor and various and sundry other rooms completed the first level, while most of the sleeping rooms were on an upper floor. There was no refrigeration in the kitchen, but a cave served to keep milk and butter. I do not remember much of my impressions of these surroundings as I was growing up. I do, however, remember a splendid rug in my sleeping room, a Navaho blanket, rose and white, that Uncle Alex had brought back from Las Animas Valley when he was on a hunting adventure in New Mexico in the late 1870s. And I might remark that even though it is nearly 100 years old it now serves the same purpose. It followed me to college and to my fraternity house to enhance the surroundings, and from there it went with me to the Philippines.

I had occasion to remember the great fireplace too, and the incident is perhaps one of my earliest memories. I was running and laughing when I stumbled headlong on a rug and slid close enough to the fireplace to burn my hand on the live coals, from which predicament I was snatched by Anna who solaced me by placing my hand in a jar of lard. I have no scars now to show from the burn.

It is hard to say whether I loved Anna or my mother more, and this indecision has lasted nearly a lifetime. My mother died when I was in India, during World War II; she was in her late eighties; but only a short while ago Anna took the same course at ninety-three, ending a long and useful life by managing her own household to within a few weeks of her departure. She had acquired a college education, a husband, and a family, and was what might be called a model citizen and a grand person.

Father had horses. One was a magnificent black Percheron Norman stallion by the name of Bonhomme Richard (Bon for

short), whose wooing techniques taught me my first lessons in the continuity of species. There were three Shetland ponies: Jessie, the mother; Dot, Jessie's son, who was not broken to ride; and a young colt. Dot was later a present to me. Once when I was still young enough to be wearing petticoats, I was astride Jessie, holding the reins, when she, being in one of her more than mischievous moods, started rapidly and ran under a swinging piece of barbed wire which dragged me from her back and ripped open a cut on my belly. That much I remember, but no more. Help was at hand, the bleeding was stopped. (Certain doctors today still remark upon examining me, "See you have your appendicitis scar!") Father had another horse that he hitched to a sulky and raced at the nearby county fairs. Then, of course, we had the less glamorous teams of work horses.

Living next door was my first girl friend, Virginia Savage, and in the house beyond hers was Ralph Ransome. We might play with her on certain days, but the two of us never saw her on the same day after experiences warranted otherwise, and wisdom forbade it. We boys were usually good friends when we found occasion to be together, though. Toward the back of the lot, Father kept several hives of honey bees. One day, to show her my bravery, I, with a croquet mallet, went bravely up and pounded on a beehive. The clever insects objected to the noise and I had my first serious lesson in entomology. My family despaired, but I recovered. The experience was not an incentive to become a bee fancier or, for that matter, to enter the field of entomology. True, I have hobnobbed in many parts of the world with various species of bees, mosquitoes, bedbugs, wasps, ants, fleas, and lice (which would head the list), to say naught of others of lesser importance. But the fevers and general discomforts these creatures brought are some things I have never learned wholly to disregard.

There was another memorable person in the environment, Jack Draden, a former slave who had come to the town with his family. He worked for Father, who gave him a small lot and helped him build a house for his wife and two boys. Jack used to tote me around and had a special nickname for me—Chuffy. Jack's wife did much of our family's washing, ironing, and cleaning. The Draden boys came over to play and would occasionally ride the ponies. Once Bud tore a wound in his hand on barbed wire, and I was surprised to see that his blood was red. Jack accompanied Father on coon hunts with our hounds, as well as helping with the stock, and working in the fields.

When my father died at eighty-six (he had worked until the day before his death), he was taken back to Maysville, to the old home town for burial. It was not exactly a sad affair, but as I left the grave I looked back and saw an ancient white-haired Negro stand-

ing on the mound of earth weeping and saying, "They've buried my best friend." Only then did I become aware of tears and become conscious of the sadness of my father's death!

Yes, my mother's family was there too, living on a farm about two miles from Maysville. Her own father, Aaron B. Mills, a musician, had died at twenty-nine, leaving his widow Jane with two daughters, Virginia and Loretta. Some years later my Grandmother remarried Richard Wilson from West Virginia, and they migrated to Missouri, where mother's half-sisters Emma, Louvina, Bertha, and Grace, and her half-brother Benjamin, were born.

They were frequent visitors at our Maysville house, especially on Sunday when they came to town to attend religious services and afterwards partook of food from our plentiful board. The adjustable walnut dining table could seat eight or sixteen with equal ease merely by inserting three more table leaves between the sliding ends.

Thus, it is more than obvious that I suffered no lack of relatives, relatives for whom I have never ceased to have high regard. There were no parasites, no freaks, no criminals. And practically all outlived the normal quota of seventy years! Tough stuff they were made of—tough and very frequently of fine materials. Several younger family members had good educations. Mother had attended a ladies seminary in Wheeling, Virginia; Father, however, had only the equivalent of a fifth grade education, but he read a great deal and kept up with the news.

My earliest journey on a train took place when I was about four. Mother was going "shopping" and she took me along. (Mother occasionally made shopping trips by train to St. Joseph, which was some thirty miles west of Maysville.) I don't recall much of the trip other than that we stopped to call on an acquaintance of Mother's; but I do remember a red velvet hat with a narrow, high crown that Mother had purchased, because I kept wondering how could she get her head in the top of the crown.

The previous year Mother had gone to Chicago to the World's Fair and had brought back a stereopticon with numerous "slides," some highly desirable toys, and a large book of engravings depicting the art display at Chicago. I began to think that the rest of the world was wonderful and that Maysville must be dull by comparison.

When I was five Mother and I really did some traveling. We spent a vacation in Colorado, stopping first at Fort Lupton (we actually stayed at the exact site of the old fort, which was on a relative's ranch). Margery, a young second-cousin who was near my age, and I had a glorious time hunting Indian stones (arrowheads, etc.) about the old adobe walls. There was also the excite-

ment of a "runaway" horse and wagon; the ranch hand driving the wagon had to be taken to a doctor for repairs.

Next, we went to Denver where Dr. Beatty, Margery's father, lived in a comfortable home. Mother and I did some sightseeing. We ascended Pike's Peak by the recently built funicular railway, which took us to Silver Plume, near the summit of the peak. Mountains, gorges, rivers, forests—what an unbelievable wonderland! How much finer to be able to live in such a place than in Maysville! At each rail stop, children with boxes of handsome stones and crystals came offering them for sale and these objects were part of the loot I carried home.

Alas, the time came to return to my own environment. Once home, I was enveloped by all the pleasures of familiar things—the taste of homemade ice cream cured in the icehouse, the odor of hickory wood from the smokehouse, the coolness of the cave where we stored milk and butter. I decided Maysville was a very good place after all. But I could never forget that journey; even then I was certain that I would see as much of the world as possible when I grew up!

2. GROWING UP

I should pass over the next years rather quickly and avoid describing those commonplaces that we have all experienced in growing up.

I went to school. I had little difficulty learning to read. In fact, reading became a most pleasurable pastime. My passion for adventure was aroused by books of the George Henty—H. Rider Haggard vintage, and these I read and reread when others were not available. I remember that one volume in particular, *Among Malay Pirates*, which was very well-illustrated, stirred my imagination and I resolved then that one day I would see these people in their dugout canoes. Years later, the dream materialized. Even the more serious lesson books were of great interest and I was more than fortunate in having instruction that I liked.

High school, too, seemed interesting and here again the high school faculty all seemed to be superior people. I believe that with one exception all were university graduates. They had the ability to obtain the best efforts from their students, and they seemed determined that their students should look forward to university life.

University life began at the University of Kansas at Lawrence in September, 1908. My first year there, 1908-09, found me living in the home of then-Governor Stubbs, since someone was needed there while the governor and his family were at the state capitol at Topeka. They would return to Lawrence most weekends. Occasionally, I was invited to Topeka for special affairs at the

governor's mansion. Paul and Rosco, the two sons, would sometimes spend a weekend at Lawrence without the family. Once Rosco and I went possum hunting and caught one two blocks from the house. Their cook, who was adept at cooking possum, prepared it for us. I did not find it too glorious, but Rosco consumed perhaps more than his rightful share and suffered a refund.

I had a very small snake (*Storeria dekayi*) which I kept in a small glass case in the conservatory of the governor's home. The snake later produced five offspring. It was not unusual for me to have a menage of this sort around; one of my early boyhood collections consisted of a number of harmless water snakes (*Natrix sipedon*) obtained at a nearby pond, which I kept alive in a vivarium. After they had been in the vivarium a while, some, when allowed their freedom, would crawl across the floor and take a small minnow from my hand. My long-suffering family soon realized that the snakes really were not happy, despite my frequent and comforting presence, and the ruling member of the household suggested, quite firmly, that they be disposed of. This decree was not carried out at once, so one morning I found that someone had provided a way out for the serpents. Mrs. Stubbs was not aware of my predilection to foster parenthood; although she did not forbid my keeping the snakes, she was not pleased.

Some time later Theodore Roosevelt was their houseguest. At breakfast one morning, Mr. Roosevelt, having recently returned from Africa, was regaling us with stories of his travels and of his experiences with certain African serpents. Mrs. Stubbs told the visitor that I had a serpent in the conservatory. At once he suggested that it be examined. They left the breakfast table for the snake exhibit. Ever after Mrs. Stubbs was delighted to display the tiny family to visitors, remarking on the former president's comments.

During the summer after my first year in the University, three other students and I accompanied one of the zoology instructors on a biological survey of southeastern Kansas; we were looking primarily for fish. I was also assigned to collect a barrel of water snakes for another zoological instructor who wanted to use them for dissection in a comparative anatomy class. The barrel was a very large one and I must confess my inadequacy in that at the end of our work I had the barrel only about two-thirds full. Its contents included three species. There were no "water moccasins," however; in fact, in the entire summer's collections, there was not a single poisonous water moccasin found despite the fact that they are not uncommon in northern Oklahoma and Arkansas.

Our leader was a veritable slave driver. My job, since I was a relatively good swimmer, was to follow our seine and remove logs, brush, and debris from it. It would be exaggerating only a

bit to say the job was continuous, and I practically learned to breathe under water. One morning, while trying to detach the seine from some object, I complained of illness; but our "leader" said "unloosen the seine." I tried, but I had to be taken out of the water. I was indeed ill, from what I later learned was malaria! In Kansas!

We started back at once for Lawrence but the movement of our covered wagon was too much for me, so we stopped at a farm, and I was bedded down in a manger in the barn. A doctor was sent for. After he diagnosed the illness as malaria, he assured my companions that I wouldn't shuffle off, and prescribed medicine for me. After three days we again started for Lawrence, this time with interruptions of only an hour or two at a time when I needed relief from the eternal shaking of the old wagon.

This case of malaria lasted about a month. Seemingly, once was enough; for despite some twenty-two years spent outside of the U.S.A.—twenty-one of them in the subtropics or tropics—I have escaped contracting malaria again, even though its presence was almost universal wherever I journeyed.

My second winter in the university I began fraternity life. Although my funds were small I eked them out by working in the library under the supervision of Carrie Watson and Mary Maud Smeltzer. I even waited tables at the old Hiawatha Restaurant for a time.

The following summer I joined the paleontological group from the Museum of Natural History in exploring the chalk beds of Kansas. These beds are lying at the bottom of what was an ancient Cretaceous sea in central Kansas. One of my professors, Dr. Clarence McClung, accompanied the group and I had my first experience in looking for fossils—not that I found many. I did, however, get a fair variety of the live reptiles and amphibians that inhabited Trego and Gove counties.

We had a bit of excitement when Dr. McClung, after finding a likely looking gully filled to the top with "tumbling tumble weeds," set fire to them. The blaze destroyed the weeds but, to our dismay, it escaped the confines of the gully walls (twenty-five feet high) and started prairie fires in the short buffalo grass on both sides of the gully. We finally were able to put them out after getting assistance from the other members of the party. It was the most strenuous task of our summer, the sun giving no respite and the clouds offering no shade.

One day while we were in the field, a rainstorm threatened and Dr. McClung suggested we return to camp with our team and cart. The storm broke; the team balked and, frightened by the ubiquitous thunder and lightning, refused to go on. So much rain fell that Dr. McClung knew the tiny waterway at the edge of

our tent would be filled to overflowing and thus could destroy much of the summer's work. He urged me to run to camp a mile-and-a-half away; I got there in time to move our prize finds back from the encroaching stream which later covered the area.

That evening, after supper, we heard a great chorus of toads which the downpour had brought up out of the prairie. It was a large species, *Bufo cognatus*. I collected fifty specimens but could have tripled this number had it been desirable. None of us had seen any of this species in the preceding weeks. The fact was that I had devoted more time to collecting reptiles and amphibians than fossils. This was good training for my work in foreign countries. When we returned to the university, my specimens were identified, catalogued, and placed in the collection in the museum.

Trips such as these afforded opportunities for closer associations with Dr. McClung, one of America's greatest geneticists, and with Dr. Roy Moody, who became America's greatest paleopathologist. In this way, I became especially fitted for my future endeavors.

3. DREAMS DO MATERIALIZE

By taking field courses during the summers, I had completed my four years field work for an A.B. degree in three and a half years. Someone asked me what I intended to do, now that I was leaving school at the end of the first semester. At first, I thought of saying, "Hunting a job," but, after a moment, said instead, with no little bombast, "I think I shall go abroad and hunt adventure!"

A few days later (believe in coincidence or not) a notice appeared in the post office; examinations were being held by the Civil Service for appointments to the Philippine Islands. The United States had taken over their governing from Spain. I passed the examination.

Reservations were made at once and about the first of February, 1912, I started for the Philippines, via San Francisco. On boarding ship, I discovered that I was not the only Civil Service appointee and that fourteen others were also Manila-bound, destined to work for the government there. Social life on board ship was excellent and we found a number of college-age girls who were "touring the Far East." Unfortunately, most were accompanied by their parents. A bridge tournament was held and partners were chosen by lot. Luckily, I was paired with a Japanese gentleman who was returning to the Far East after having toured the United States. Largely because of his astute bidding and card sense, and with some aid from me, we got the first prize: two handsomely carved ivory cribbage boards!

Hawaii was a delight. When we came into port, a band was playing on the dock, people were coming with leis to welcome us, swimmers beside the boat were diving under water for coins tossed

by passengers, and voices were singing "Aloha." It was a thrill that will probably never be surpassed. (It was an experience that was repeated eight times in succeeding years.) The following day in my freshwater bathing suit I appeared at Waikiki, the famous beach, for my first saltwater swim. It was a new experience to find saltwater much more buoyant than fresh, but of course I should have known that. Out beyond the surf riders I noted some interesting-looking rollers. I swam for some distance and suddenly found myself lifted up and set down against sharp corals. I got away as quickly as possible but only after receiving a number of open cuts on my feet which gave me reason for staying off the dance floor for several days.

One of the girls with whom I had danced frequently belonged to one of the old missionary families who knew the elderly Queen Lil. She took me on a tour of the city; one of its highlights was stopping by the queen's home, which was scarcely royal, and finding her seated in the yard. We went also to the Pali, with its rain clouds, and to the old palace.

We left the next day and received a farewell almost as thrilling as our welcome, with the sights and sounds much the same. The ocean voyage from Hawaii to Japan was uneventful except for seeing an occasional ship, or a whale blowing in the distance, or schools of flying fish. Below deck there were a number of gambling devices available, some of which I sampled at not too great a cost.

Nagasaki was our first stop. We sampled the saki; learned of the usefulness of the temple teahouses; and of the famous No. 9. (The recent movie "Teahouse of the August Moon" resurrected memories.)

In the Japanese equivalent of a drugstore, I found the charred remains of an oriental copperhead snake (*Agkistrodon*) offered for sale as a panacea for various ailments. Other serpents were preserved in bottles with an ample supply of alcohol, which also served as a strong medicine. Some years later while passing through Nagasaki on a honeymoon journey, I visited a shop in which an elapine serpent occupied a large glass jar perhaps two-and-one-half feet high. I suspected that the animal, from Okinawa, was at that time an undescribed form. I offered to purchase it.

"No sell," the druggist replied.

"I give five yen."

"No sell."

I offered ten yen.

"No sell."

"Perhaps you would sell for twenty-five yen."

"No sell."

"Fifty yen?"

"No sell. One man, Stejneger, he offer seventy-five yen, no sell.

One year the alcohol from the bottles sell seventy-five yen. No sell snake." So I gathered from the conversation that the serpent was not on the market.

Japan was different from Honolulu. This was certainly true of the dress of the people, with the women in kimonos and the men in similar costumes. Of course, even then many men, and occasionally women, wore Western-style apparel. Only infrequently would a small auto be seen, but there were many horses as well as the ubiquitous jinrickshas and carts pulled by either men or women. At Kobe I saw for the first time a ship "coaled" by coal passing. The coal was placed in small baskets and passed by hand from one person to another along a chain to the ship's hold; perhaps fifteen people handled each basket. Whether such a system is still in use I do not know.

We finally reached Manila. On a Saturday afternoon we came past Corregidor into Manila Bay and docked. It was a dull affair after Honolulu. The Manila Hotel had rooms available and I went there.

Sunday all offices were closed so I hired a small launch and crossed the bay to the Bataan peninsula. I tied the boat to a tree and entered the forest where I came upon a dim path. This I followed several hundred yards to a small clearing where *camotes* (sweet potatoes) were growing. Just then, I saw a native coming toward me from beyond the clearing and I thought, "Wow! My first wild man." He stood little more than four feet tall, had very black skin, hair several inches long, and a beard. He boasted only a G-string in the way of clothing and to complete his costume he carried a long spear and a bolo knife. I stepped back from the path and watched him. Presently he saw me and yelled, "Good morning. I go St. Louis."

I learned later that he had really been to St. Louis for the 1906 World's Fair and had been exhibited by a showman as "The Wild Man from Borneo;" he actually belonged to the tribe known as the Negritos, or Atas. Before we separated he spoke more English: "Gimme cigarette." What a comedown for me. Subsequently I saw his "house," which consisted of a group of branches propped up against a large fallen log five or six feet in diameter, with palm leaves tied to the branches to shed rain. A young woman, perhaps his wife or daughter, was near the house nursing a fire over which she was boiling rice. Her height was a little less than my "wild man's." Obviously she had been gardening, for she was dressed in a series of *camote* vines wrapped around her middle. The "garment" was a cure for "a sick" in her stomach.

On Monday the internship officially began with a meeting of our group from the boat and the Civil Service committee. We were sent to Baguio in the northern part of Luzon for a general indoctri-

nation which would place special emphasis on a study of the peoples of the islands and their history. The Americans had been in the islands for about fourteen years at that time and had established a fairly stable government. But to be sure there was ill-feeling for the Americans among the local politicians who had tried to take over when the Spaniards had been ousted. For the first few years there had been warfare; Aguinaldo had been the chief leader of the Filipinos.

The positions available to my group of would-be civil servants varied; there were jobs for secretaries, school supervisors, teachers, etc. One assignment called for setting up a school and teaching among the people known as Manobos, in central Mindanao, the second largest island of the Philippines, located far to the south. Nobody wanted this task, but I foresaw adventure waiting there, since the people were designated as headhunters.

The Manobos lived in groups ruled by chieftains called *datos*. There was much intertribal warfare, with war parties raiding each others' villages and warriors taking their enemies' heads as trophies.

The constabulary had been unable to stop these battles merely by punishing the raiders. So a more peaceful method was sought. The plan was to establish a school and demand that each *dato* send a boy, preferably a son or some other close relative, to attend the school along with other youths from the various groups. It was hoped that by bringing the young of the tribes together, they might get acquainted and forget past wrongs.

The school was to be built in Bunawan and the curriculum was to be chiefly baseball and corn-growing. Later we planned to provide classes in elementary English (at this time Spanish was the official language of the islands but English was also taught in most of the schools).

Having finished the orientation, our group in Baguio split up and we set out for various destinations. I traveled by interisland boat, which had a regular run from Manila to Cebu. At Cebu I waited several days for transportation to Butuan, the capital of the province in which much of the Manobo population was to be found. At Butuan, which is near the mouth of the Agusan River on Mindanao, I was delayed some little time waiting for the high tide that would permit the boat to pass the bar near the mouth and go on up to the wharf.

I was met by a Mr. Scott, a school man, and the governor of the province. That first evening there was a dinner with three other government workers as guests. They had much to tell me of the Manobos and of my prospects at Bunawan, which they said was quite safe. We discussed the wisdom of my carrying a gun, but the governor said, jokingly, "The natives would probably kill you quicker

for the gun than for your head!" And he ruled against my taking any arms.

4. ALONG CROCODILE ROAD

There were practically no roads through the province, so travel was by river. We had hoped to make the journey up the river in a launch which the governor of Agusan used for his inspection journeys in the province, but this unfortunately was temporarily out of order and other means of travel had to be devised. Consequently, a bamboo raft was prepared.

This, of course, was my primary concern; putting up with Mr. Scott while I was fabricating the raft was my second. Bamboo is a gigantic member of the grass family; sometimes the stems are forty or more feet high and three to five inches in diameter. The stems are jointed and hollow. Each joint has a separate cavity two to four inches in diameter, which accounts for bamboo's buoyancy in water. The outer walls of the stems are very hard and perfectly smooth save at the joints, where there may be small leaves and tiny sharp spines that are easily brushed away; water cannot enter. The cut stems are fastened together into a platform with strips of rattan made from the outer part of the vinelike trunk of a climbing palm. When two or three layers of such platforms are placed one above the other and tied together, they may support a superstructure for protection from the sun and a surprising amount of cargo, as well as a crew of oarsmen and passengers.

The material for this raft had been prepared the preceding day. I had gone into the forest with the men who cut the bamboo with their large bolo knives, tied it in bundles, and had it dragged out by a carabao, a domestic buffalo the Filipinos use for a draft animal.

I also accompanied the group as they looked for rattan, which most of us know as the "cane" that we find woven into the seats or backs of chairs. As stated this material is stripped from the outer wall of a strange palm that grows like a vine from the ground, climbing up a tree that supports it as long as the tree lives. If the supporting tree should fall, the palm trunk grows along the ground, moving much like a great serpent, until it contacts another tree and climbs this. Sometimes the trunk is more than two hundred feet long with the foliage and fruits found only at the growing end. Since it does not increase in diameter, the entire trunk usually grows to only one-and-a-half to two-and-a-half inches across! This trunk also contains a clear sap that looks like water and is nearly as tasteless. A piece six or eight feet long cut from the trunk will hold enough liquid to fill a canteen. Having learned this I rarely had to carry drinking water during my jungle travels.

My first impression of the jungle was not the best. We had to

follow game trails used by deer or by the fierce-looking wild boar to find our way through the thick growth. There were a few fallen trees covered with an amazing number of vines and plants that were still alive. The living trees of the forest, unlike those in our American woods, often looked unhealthy because of dead leaves mingled with the green ones. In this land of eternal summer, these trees did not have the long winter rest that trees from cooler zones experience. Frequently the foliage of ferns, orchids, or other plants formed unsightly masses, often becoming so heavy as to break off the branch on which they grew. Vines—lianas—some slender, some thicker, might swing from a branch or be attached to a trunk and might be decorated with other plants.

I saw a few birds in the low trees or shrubs, but if there were songbirds they were high in the trees, too far away to be heard. Occasionally the great ugly *callaos* (hornbills) were heard as they flapped noisily from tree to tree, squalling their unpleasant call in voices that make the crow's seem musical by comparison.

The leaves of the palm furnishing the rattan had very elongate, whiplike tips hanging several feet in length, each with numerous, circular series of upward-directed short spines. On the extreme tips of several one noted curious rounded masses of fine fibers and tiny grass leaves with an opening on the underside. These proved to be birds' nests with eggs, whose tiny owners were scarcely larger than hummingbirds. Dressed in flashing iridescent purple, they were perched in the nearby shrubs scolding, angry indeed at having their homes destroyed. Apparently the birds chose these long slender tips on which to hang their nests to discourage prowling arboreal serpents from eating eggs and young. It seems that the snakes are afraid to venture over the very slender thorny surface of the tip.

They certainly weren't afraid to venture elsewhere—the snakes, that is. One of the men leading the way suddenly rushed back toward us yelling, "*Sawa!*" I ran forward and saw a beautifully colored python disappearing into a heavy thicket of bamboo, a thicket so dense that there was no hope of capturing the snake.

We returned to Butuan without further incident and prepared the craft for the upriver journey. The local police found *grumetes* (oarsmen) who would row the raft upriver for me and then return to Butuan.

One morning before sunrise my bags and boxes were taken down to the dock and I went aboard my craft. The sun came up yielding its usual quota of light and heat on the earth as well as on the passenger, cargo, and crew. As we started off, I could not help thinking of what my recent American acquaintances had jokingly said about losing my head. While I was not particularly afraid, I had to confess that the beginning of the journey did oc-

casian a certain uneasiness as I contemplated living in the village of Bunawan and moving about in the area, visiting the villages of the Manobos. At first I studied my surroundings, watched the river for logs and the bank for crocodiles. The light reflection from the water is irritating to unaccustomed eyes, sometimes producing temporary blindness in the same way as light reflections from snow. Of this I was to learn later.

We made occasional short stops to give the *grumetes* a rest. During lunch hour I entered the forest to search for specimens while I consumed the small lunch brought from Butuan. Returning to the river bank, I saw a sudden flash of colors come near as a small gliding lizard alighted on a nearby tree trunk. It was a *Draco*, of which I had read but had never seen. It clung to the tree bark, folded its wings, which were supported by five elongate ribs along the sides of the body, and then began to elevate a curious, highly colored projection on the underside of its throat. This specimen was joined shortly by the female, which lacks the projection on the throat (all females lack these appendages). It appears that members of the many *Draco* species mate for life. The male continually displayed this ornament, called a dewlap, and also raised his body away from the tree surface as if trying to stand on tiptoes! I tried to collect them, but both escaped.

I was so interested in watching the river banks that I failed to find interest in the magazines, mostly ancient, I had acquired in Butuan. We passed numerous clearings and could occasionally see patches of yams, upland rice, millet, and eggplant (an elongate variety called *berenjena*). If there was a house at the clearing, there was also a small bamboo pen at the edge of the river where the Manobo could bathe in comparative safety from the crocodiles or obtain water to carry to the clearing.

At this time of the year the river was relatively low and the strength of the downstream current varied. Occasionally a current might be encountered where the river narrowed. That would reverse the craft; the *grumetes* would then have to right it and hug the bank until the swift current was passed. Once while we were moving very close to shore, I noticed a branch hanging low over the water—on it was coiled a young python. As we went under the tree I grabbed the serpent from the branch and pulled it onto the raft. When the oarsmen saw this, two leaped into the water with much splashing about, while the man next to the shore jumped to the bank, holding the raft to keep it from being carried back down the river. The two other men grabbed oars, thinking to kill the snake with them. Now, I knew that the snake was not poisonous and, although it was a little more than six feet long, and not as thick as my wrist, it could do no serious injury. The men, of course, thought it dangerous and were risking being eaten by a

crocodile rather than remain on the raft with this snake. I hastily crammed it into an empty rice sack, the snake in the process showing its resentment to this indignity by biting me. The bite was not pleasant, for the sharp teeth punctured my arm, but it was no more dangerous than punctures made by several small sharp thorns. I had caught my first Mindanao specimen! Had the animal been full grown (they grow to a length of from twenty-five to thirty feet and become as thick as one's thigh), I would have had to attempt a very different means of capture.

The men were finally coaxed back on the raft and we started again. But I had become to them a person of more importance, one who did not fear the snake and was not injured by its dreaded bite. Surely I had great magic powers, perhaps as great as those of their priestess who, they said, could talk to the gods and devils.

I spent the rest of the afternoon learning Manobo words. I would point to an object or animal or to parts of the body, the men would give me a name, and I would write down the word and try to pronounce it. Thus I learned the *buaya* was crocodile; *isda*, the fish; *wahig*, water. I knew that soon I had to be able to speak, at least a little, to those people in their own tongue if I were to become their friend, even though some of the older settlers of the town might speak Spanish, a language I had already studied.

At sundown we stopped for the night. I watched the *grumetes* as they set about to collect firewood, a pole of dead bamboo, together with dead branches from a fallen tree. Pairs of stones a few inches apart were set up for stoves, and pieces of burning limbs were placed between the stones. Supper preparations could now be started. Several handfuls of unpolished rice were taken to the river's edge and washed many times by rubbing the grains together between the palms. This technique removed bits of loose starch from the rice so that the cooked rice grains would not adhere to each other. Then the rice was put in one of the burned-clay pots, covered with an inch-and-a-half of water, and set upon the fire to boil. A few *camotes* were washed and laid in the ashes of the main fire to roast. By sign language, I induced the men to boil a pot of water for my instant coffee, made from the "George Washington Coffee" I had brought along. I would use the excess boiled water to fill my canteens for the next day.

The rice and *camotes* were soon cooked, and we relieved our hunger. The rice was eaten with the hand as if the grains were so many bread crumbs; a bunch of bananas suspended from the canopy on the raft was our dessert. Our plates were square sections cut from the huge, glassy-smooth leaves of wild banana plants; our cups were of bamboo.

Since we had seen crocodiles in the vicinity when we approached the shore, I had the men cut a small path back from the

river bank for fifty yards, where the vegetation was somewhat less dense and where the mosquito swarms were probably smaller. Sleeping there would lessen the chance of being disturbed by a roving crocodile. It was getting dark so I lighted my Coleman lantern, purchased in Manila, and had the men set up my army cot. At each corner of the cot they placed a stake about six feet high, to which my mosquito net could be fastened. They fetched a heavy woolen blanket from the raft because the nights were usually chill. I had also brought my python from the raft and had suspended its sack by a strip of rattan on the underside of a limb, so it would not serve as bait for other animals. For themselves, the men placed four thick bamboo stakes in the ground, lashed cross-pieces to them about two feet above the ground, and laid split bamboo strips on the crosspieces. Thus they had a dry bed, two feet wide and six feet long, raised above the wet forest floor. They had no mosquito nets, and I felt sorry for their having to put up with the mosquitoes feeding on them during the night.

As night fell I began hearing frog voices and other strange calls that I suspected came from night birds or lizards. Once we were prepared for the night, I decided to take my light and try to locate the source of these sounds. When they saw I was going to leave camp, my men became very agitated and tried to prevent me from going, but I could not understand all that they were saying. I learned later that, brave as they are, the Manobos are afraid of the forest at night. They ascend to their houses and bar the doors, for at night the forest belongs to the animals, the gods, and the devils. If they must venture into the dark jungle at all, it is only in armed parties.

Hacking at vines, shrubs, and branches with a bolo, I pushed some distance from the river in the general direction of the sounds and came upon a trunk of a huge, recently fallen tree, over which clambered a profusion of living vines, ferns, orchids, and begonias. (In this territory where there is little wind, many large trees have no taproot, but only a series of small roots which, with buttresses, hold them up; they may become unbalanced and fall.) When such a tree is standing upright, it shelters the animals in which I was interested—lizards, serpents, frogs, and toads—far out of reach of a collector. But here was this one lying on the ground, ready for me to begin my search for its inhabitants; I only hoped all the animals hadn't been killed by the fall.

I approached the trunk with extreme caution, trying not to disturb any creatures that might be present, and listened carefully. Despite my silence the frogs had quit calling. I waited one minute, two minutes, five, ten minutes when a feeble frog call rewarded my patience. Then another, and another, each stronger than the previous one. I moved forward and tried to see the frogs. Surely

the sound was coming from a leaf resting against the trunk just above my head—but I saw no frog. At another point, where a curly-leaved fern thrust up from a branch, I was sure I heard another frog calling, but again, no frog. They must have been invisible, or else they could throw their voices.

I did find a small gecko, a lizard less than three inches long, hidden between some leaves. As it ran across a leaf I grabbed it and started to put it in my collecting bag; on opening my hand I found that I held only its tail, which had broken off. The tail was writhing and twisting, turning over and over as if it were in fact a live animal, but the animal was gone. It was a demonstration of a curious trick that many kinds of lizards use when a snake or other animal seeks to capture them. The lizard, seized by the tail, merely detaches it and escapes, while the snake stops to consume the twisting tidbit. Meanwhile the lizard has suffered no serious ill effect, only the loss of a drop or two of blood. A new tail begins growing soon, and after several months the lizard has a fine new tail; it does, however, look different from the old one. This tail, too, may have to be sacrificed to save the lizard's life. If so, another will be grown!

The root mass of a large fern became a tempting distraction and I began digging in it with my bolo. I unearthed a number of insects, worms, and centipedes. Then to my surprise and delight there appeared a small shiny-scaled snake (*Typhlops*), no bigger around than a pencil, and only a little longer. Its tail was no longer than the width of the body and was tipped with a tiny spine. It made no attempt to bite me as the python had. I suppose it just hadn't learned that snakes were supposed to bite. The most extraordinary thing was that the snake had no visible eyes; it was totally blind. I wondered what strange sense organs this creature possessed to enable it to find its way up trees in total darkness, to burrow into root masses of air plants and find worms and centipedes or frogs to eat, to find places to hide its tiny eggs and bring its young into the world, all this without eyes, or a voice, or arms and legs, without any obvious way of protecting itself. Surely such a creature is a marvel.

Subsequently, two small lizards were captured, and as I moved silently forward toward the top of the tree I was suddenly startled by a great commotion directly in front of me. I froze, stiff with fright, as a wild boar—a massive sow—emerged from a mass of shrubs. She had been asleep with her litter of pigs. For a moment she was blinded by the light, moving round and round, snorting and cavorting; then she saw me and started her charge. Coming to my senses I quickly grabbed a branch and, still holding my light, pulled myself onto the top of the fallen trunk. She now had become accustomed to the light and was rearing up against the trunk in an attempt

to get at me, but I was quite out of reach of her tusks. After some time she collected her squealing pigs and moved off into the dark jungle, still grunting her obvious displeasure at having been awakened from a sound sleep. My heart was pumping fast with fright.

While recovering my composure, I solved the mystery of the invisible frogs. I discovered atop the fallen trunk little pockets of water; beside one was a handsome male frog (*Rhacophorus*), presumably calling for a mate. It was a vivid yellow with handsome decorations of brown. Its great bulging eyes, blinded by my light, blinked slowly. I picked it up without difficulty and examined it. The hands and feet were large, their tips expanded and equipped with sticky pads. Between the fingers and toes were ample webs of skin, which were not for swimming because these were tree frogs that even put their eggs high in the branches. The webs act as parachutes, of a sort. As the frogs hop from leaf to leaf, or branch to branch trying to capture a night-flying moth, there is always the chance of a fall. When this happens the frog spreads its hands and feet, flattens its body, and lands as easily as a paratrooper. The books call this creature the "flying frog."

Another frog call took me from my path, and I soon came across a game trail and followed it a few yards. Some recently cut branches caught my attention and I noticed a partly hidden cord crossing the trail. Then I saw that a small sapling had been pulled laterally as far as possible; its top was cut off and a sturdy bamboo spear attached to its end. Had I not seen that small cord on the trail I would have sprung the trap, and the bamboo spear might have penetrated me instead of a passing deer, for which it had been intended. I had discovered that devils were not the only dangers in the forest.

When I returned to camp I found that we had visitors. Several local Manobos had seen us land and suspected that we intended to rob their farms, located on our side of the river but farther down than I had been. They came to investigate and my men had told them that we were not robbers, that I was a "government Americano." They must have been reassured, for when I arrived the visitors were squatting in the dugout canoe with their spears, swatting at mosquitoes and chewing betel nut. This nut grows on a tall slender palm; the natives chew it with lime, *buyo* leaves, and a bit of tobacco into a huge wad that is held between the lips. The juice permanently stains their lips and tongues an orange-red and blackens their teeth.

Finally the local Manobos left, and I went to my cot and crawled in under the mosquito net. Sleep did not come at once as I thought over the happenings of the day and wondered what the year held in store for me. How would I fare with these people, with their gods and devils, and with the jungle? I began to realize I was not as

brave as I had thought, but was also aware that I must make the natives think I feared nothing. If anything I felt that I might do well to make them afraid of me, and prove that I had strong magic and could kill, even though I didn't have a gun.

The next morning, after a hasty breakfast, we placed the baggage on the raft and were again slowly pushing upriver against our ever-changing current. My specimens of frogs and lizards were preserved in formaldehyde; in my notebooks I recorded the colors and the behavior of the animals, as seen in daylight, as well as the manner and place of their capture. My python had become quite content to sleep in its sack in the shade, but the *grumetes* always avoided coming near it. I wished that I could have understood the comments they made about its capture and about the "Mericano" who braved the jungle devils at night merely to find frogs and lizards, and who had magic enough to escape unscathed from the bite of the *sawa*.

Once during the morning we stopped at a clearing and traded some of our rice for *camotes*, a few ears of green corn, and other native vegetables and fruits together with a quantity of millet that, when boiled, would serve as my breakfast cereal. I had indulged in the luxury of bringing along cases of canned milk; cow's milk in this country is unknown, and milk is rarely taken from the goat or the carabao. Mothers furnished the milk for their babies.

Late in the afternoon we passed Talacogan, a large settlement that had long been established. Its inhabitants were of varied origin: Christian Visayans, who had emigrated from islands north of Mindanao; Chinese, who were tradesmen or small merchants; but the majority were Manobos, who had built houses in the town and used their old jungle houses only while working their clearings in the forest. Many had lived here for years and were fairly civilized.

Two more nights and days passed before we approached the small village of Bunawan. We had left the great Agusan River the previous day and were now ascending the Bunawan, one of the larger branches of the Agusan, which had a stronger current. This river really had many Manobo names, one for each stretch of river between villages. I never learned them all.

Learning more of the Manobo language, though, had now become something of a game. My men would call my attention to new animals or birds as they came in sight, and we would try to talk about them in Manobo. When I did not understand what they were saying, the men would repeat their words in a louder voice, as if I were deaf!

As we moved up the Bunawan, we saw wandering groups of monkeys silently watching us from the trees along the river; they would begin chattering only after we had passed. It seems they were great pests to the farmers in the daytime, raiding cornfields and

stealing fruit when the watchful eye of the native was turned. The men pointed out the strange nest of the *callao*, the loud-mouthed bird with a huge bill (it looks as if it were the great-grandfather of the Kansas Jayhawk). The bird nests in the cavity of a tree trunk, where the female lays the eggs. The male carries mud to plaster up most of the opening so that the incubating female can only stick out her head. Of course, the male has to feed her, which he seems to do quite willingly, perhaps because he knows that the eggs will be properly cared for and that the female won't be going to afternoon bridge parties, or gossiping with the neighbors over the back fence, letting the eggs get cold. And she is probably content to stay put



FIG. 1.—E. H. Taylor, 1912-13, at the age of about 23-24 years, in the Philippines. Photo courtesy of Kraig Adler.

because she loses her old feathers and grows a new lot while in seclusion.

At last, as we rounded a bend in the river, the village of Bunawan came into view. A crowd had already gathered on the bank, having learned by jungle telegraph of our coming. The villagers had received a report of our trip before we had been gone from the coast half a day—"seven-man raft, one Mericano, government man, plenty cargo, no soldier." The telegraph appeared to be a most efficient use of the elements at hand. Many large forest trees had buttresses growing out from the trunk near the ground; they usually were only a few inches thick, but ten to fifteen feet high, and often extended from the tree as much as twenty feet. The buttresses served to prop up the tree and, together with the roots, held it erect. When the buttresses were struck with a club they gave forth a very loud booming sound that could be heard over a long distance. In this manner, messages were relayed very rapidly from one farm or village to the next. Unfortunately, I never learned this telegraph code or how to send a message.

About noon we drew up to the *pantalon*, a small bamboo pier. My bags and cargo were taken to the *presidencia*, a government house where officials passing through might be temporarily quartered. Several men seeking a job as a *muchacho* or houseboy waited on the steps of the house for me to appear. I looked them over and chose one who knew a little Spanish and set him the task of preparing my lunch.

Our cooking arrangements were relatively primitive and promised to remain that way. Our stove was a heavy platform on which earth and stones were piled to hold up the clay pots when fires were built. I had a few kitchen utensils and a few dishes. My houseboy knew how to cook rice and to boil vegetables reasonably well, but, since I, of course, knew nothing about cooking, there was little I could teach him. There would be no bread, no apple pies, no ice cream—foods I had considered necessary to support life. It was rather a dull prospect.

5. MY NEW NEIGHBORHOOD

I took a short siesta after lunch, and when I awakened, refreshed, I decided to walk about the town to see what I might discover. There was a trading store or *tienda* where the natives brought in products, chiefly abaca fibers, to trade for rice or corn imported by the government from China or from other areas of the Philippines. The Visayan and Chinese inhabitants who spoke some Spanish interrupted what they were doing and greeted me with "*Buenos dias Señor.*" The men were dressed in ordinary undershirts and trousers. The Manobos were somewhat more aloof and kept their distance. They were dressed more colorfully in very short, decorated trousers.

Most of the villagers went back to their tasks after they had finished inspecting me, but a number stopped to lounge on the broad stairway of the presidentialia.

Because of the dampness most houses were built off the ground and seemed to follow the same general plan. Four great hardwood posts were erected; and about ten or twelve feet from the ground, four more slender poles were lashed between them with rattan. These poles served to support a floor, made of long pieces of split bamboo held in place with rattan. The framework for the roof was constructed by laying four heavy timbers on top of the four corner posts and then fastening a series of slender bamboo poles to the heavier ones. Woven, palm-leaf shingles were attached to the bamboo so that water could not penetrate the roof. The walls were bamboo slats covered with the same shingles; the door was made from strips of bamboo. Frames of palm-leaf shingles, called *media aguas*, were used as coverings for windows. These could be opened and raised outward to let in light or closed against the rain. As a decorative touch, air plants of the orchid family were brought in from the forest and hung under the eaves.

Each house had a small yard and was usually surrounded by fruit trees. I found that they bore an astounding variety—luscious mangoes with a delicious flavor like no other fruit, russet globes called *chicos*, breadfruit, filled with edible seeds the size of chestnuts, great arboreal jackfruits that were as large and almost as heavy as watermelons but quite different in appearance, *lanzones*, *baunas*, and even oranges. Outside the town where the land had been cleared I found extensive plantings of bananas and of garden vegetables. There was also a small cemetery.

I crossed the river to the site that had been acquired for the proposed school and farm and again I almost despaired of the project. The land had been partially cleared many years before, but much of it had been covered with new forest growth and only a small clearing remained. Piled about were boards sawed from a tree known as the Philippine mahogany, and two Chinese workmen, employed by the governor, were sawing more logs into boards. When sufficient wood had been prepared, construction would be started on a school-dormitory for the boys and on a house for me. Corrugated iron for the roofs of both buildings was already at hand, having been shipped in from Manila.

When I returned to the village there was much excitement. The body of a fourteen-year-old Manobo girl had been found in one of the clearings upriver. She had been sold by her father to an old, one-eyed man for a wife, but she had refused to stay in her husband's house since already she had a sweetheart. He was still too young to be able to pay the bride price of grain, spears, and cloth that the father demanded. So the girl had run away from the old man and

had presumably hidden on her father's clearing, but no one knows what happened to her after that. Some thought she had been bitten by the deadly *haguason*, the cobra, while others maintained that she had eaten the poison berries, the juice of which is put in pools to kill fish. Her clothes, of abaca cloth decorated and embroidered with colored yarns, were muddied and bedraggled. Her body, badly bloated, gave me no certain clues that would indicate the exact cause of death. But this was not as important as the fact of her death, that she must have felt dying was the only way to escape a dreary and unwanted husband. Somehow I had not realized that these people, too, experienced the tragedies common to all mankind, and that young love in Mindanao could be beset with the same troubles as befell it elsewhere in the world.

She was buried in a crude coffin in a shallow grave. About thirty women, a few men, and numerous children made up the funeral procession that followed the pallbearers to the cemetery. The women, by moaning, shrieking, and wailing at the tops of their voices as the grave was filled, showed their great respect to the dead and their sympathy for the parents. When the coffin was covered, the mourners went back to their own homes to pound the husks from the rice for the evening meal, or to take up their weaving, or to resume their other mundane duties.

One morning at breakfast my houseboy brought me some very serious news. "Señor," he addressed me in Spanish, "was *pangayao* in the village Sagulunto. *Saccopies Dato* Taoidi kill much people. Think maybe come Bunawan for *pangayao* also maybe. I have afraid." Translated that means that the followers of the old *Dato* Taoidi, a notorious headhunter, had raided a distant town and killed several people and that they might come to Bunawan to make a raid, and that my houseboy was afraid.

After breakfast I walked down to the store to get more information about this latest headhunt. A native of the village that had been raided had fled to Bunawan and told us how a war party had come by way of the river and had hidden in the forest near his village. The first killings occurred about nightfall, when one or two men living in the more isolated places were attacked as they were ascending the notched bamboo poles to their tree houses. At another house a raider, pretending to be a neighbor, called the dweller to come out and then with a well-directed spear pinned his victim to the door; his dying screams alarmed the residents of houses within hearing distance. The visitor didn't know the details of all the killings, but he was certain that at least six persons had died before the attackers left. He said he was sure the raiders were the subjects of *Dato* Taoidi, the outlaw for whom the constabulary had been searching ever since a group of eight soldiers had been waylaid and killed by his people. I made a preliminary report of the affair for the

governor. He needed additional information and so had soldiers return with the newsbearer to the raided village.

There was talk among the Manobos that perhaps they would help the villagers of Saguhunto go against the villages of Taoidi. They speculated whether a war party might attack our town, but this idea was disabused by some of the Visayans who were sure that Bunawan was safe. I, too, was dubious of such a prospect and went about my daily work.

The pile of boards had greatly increased, and as soon as the carpenters arrived from the coast they would begin work on our buildings. In the interim, we began the planting. I had a man prepare ground for a vegetable garden, and I put in the onion, radish, tomato, and eggplant seeds I had brought with me. On part of the cleared land, we planted more than a hundred banana suckers; in a small swamp area, *gabi*, a root vegetable, with arumlike leaves; and in another plot, manioc, the tapioca plant which produced large tubers.

The carpenters finally arrived and the buildings went up rapidly. A carabao had been purchased to help drag the heavy poles for the corners of the buildings. The animal was afraid of me but not of any of the natives. It assumed a threatening attitude if I came close to it and would snort and stamp its feet in warning. It took several weeks for it to become accustomed to me.

I began to take short jaunts into the great forest surrounding the school farm. The forest spread out to the east and north for thirty to forty kilometers in each direction, and in this territory there was not a single known human inhabitant. Presumably the area was taboo and no one could, or at least no one would, live there. When I tried to find out why, nobody seemed quite certain. It may have been that in the past the blackwater fever or smallpox had killed any inhabitants, but the people at Bunawan just shrugged their shoulders and said many gods and devils lived there. And it was impossible for me to tell whether the forest had ever been cleared. At any rate I foresaw being able to explore this region of three-hundred square miles without the risk of a chance encounter with a headhunter; and I had regained enough of my arrogance to think I could easily outwit the gods and devils.

One or two of the local Manobo boys I had chosen for the school were allowed to accompany me to carry my specimen sacks and a bolo, to help me turn over logs, and what was more important, to warn me of traps. They brought along the weapons, blowguns or a bow and arrow or, perhaps, only a spear. At first they did not like the idea of my catching serpents; they would run away each time I caught one and I would have to coax and plead to get them back. Later when they learned that the small shiny skinks (lizards) were harmless they would try to get specimens for me. The day Tiburcio

shot a flying lizard on the wing with a blowgun, he became a most enthusiastic helper. His feat earned deservedly high praise even if it was the result of a happy accident! From then on, he would sometimes induce other boys to accompany him to hunt for specimens.

On these trips I would practice speaking their language and try to teach them American words and phrases. Most of the boys had two names, one given by their parents which might describe a characteristic or quality—strong man, hunter, fisher, crooked eye, tall reed, and so on. At a later time, when the priests came to their villages, they had acquired "Christian" names, Spanish names such as Antonio, Pedro, Eleoterio, or Juan. At least one of these priests was reported to have been killed in Bunawan and no one knew how many more had met such a fate.

The boys were naturally curious about me, wanting to know how many men I had killed and how many heads I had taken. Did I have a gun? They thought maybe I was a coward. But I assured them I did not need a gun to kill and bragged that if I wanted to kill somebody at Talacogan or even at Butuan I could do it without going to either place. I established my magical powers by performing a few ordinary sleight-of-hand tricks and by using a bit of harmless subterfuge. I told the boys I could make a coin disappear or put a snake in somebody's pocket. Sure enough, one boy or another would find the small, harmless snake or the coin that I had placed in his pocket a few minutes before. I convinced them I had great power over snakes by means of a small green one I had found at Bunawan. It could be placed in a certain position from which it would not move for hours, and to the boys this was the most amazing magic of all. I was even beginning to believe myself omnipotent and discovered a way to reinforce that idea among my charges. While reading about a forthcoming eclipse of the moon in my month-old American newspaper from Manila, I remembered an incident from one of my childhood books, *Alan Quartermain* by H. Rider Haggard, in which the foretelling of such an event had awed the native Africans. So I told the boys that I would have the moon taken out of the sky very soon. But that was going a little too far and, in disbelief, they said that the great crab *Tuda* ate the moon and that I could do no such thing. I told them to wait and see.

The rains, which up to this time had come in gentle showers perhaps twice a week, now began to arrive daily and increased in intensity, lasting from half-an-hour to as much as two hours. There was no lightning and no thunder, and to the best of my remembrance, I did not see lightning nor hear thunder in my two years at Bunawan. Only once was the wind stronger than what we would call a heavy breeze.

One afternoon I crossed the river to go to the village and came unexpectedly into a small new clearing. About seventy-five yards

from the edge of the clearing a house was in the process of construction. It was obviously being built by one of the forest men who had been persuaded to come to town to learn about civilization. I had scarcely entered the clearing when a carabao tethered to a tree beside her young calf saw me. She bellowed, got up, and prepared to charge. I ran rapidly toward the house, the carabao following. When she had run as far as the rope tied to a ring at the end of her nose would allow, she was stopped at least temporarily while I gained the shelter of the house. As I approached the house I called out, "*Laki aco*, I am friend," then ascended the notched pole that led to the entrance. Meanwhile the carabao returned to her calf.

In the single room of the house were two men, a woman, and a small child approximately two years old. All were startled at my arrival and seemed much afraid of me. The child began to cry lustily because mothers there, as in many other places, try to discipline their children by telling them the bad man will get them if they are not good. Here the worst thing they could say was that the *Americano* would get them! The frightened child probably thought I had come to take him. While the mother sought to calm her baby, I tried to talk to the men but they were reluctant to respond and I did not understand them very well. The child, at last quiet, had left its mother and was moving over to the father, but in so doing slipped and fell through an opening in the unfinished floor to the muck twelve feet below.

I swung from the side beam of the house to the ground and, reaching the child first, picked him up, only to discover that his tiny pipstem of an arm had been broken above the elbow. The bone had pierced the flesh and had been driven into the muck by the fall. The fall and the pain had rendered the child unconscious. The parents, seeing the child motionless, thought him dead, and pandemonium broke loose about me. The mother was screaming frenziedly and was trying to take the child from my arms. The father and the visitor had seized their bolos and were slashing the air, often quite close to me, striking terrific blows against the walls and the heavy poles that supported the house. They were yelling out their most terrible curse, "*lintic yawa*" (may lightning strike you). I expected them to turn on me with their knives, but maintained my hold on the limp child. I remembered all too well the Manobo code of a life for a life and knew I must save him.

The commotion had attracted the attention of neighbors who came running with their knives, thinking that a raiding party was attacking. One of the newcomers knew a little Spanish so I told him to go to my lodgings and get the medicine kit from my house-boy. The child had begun to whimper and the mother quieted down, seeing that her baby was alive, but the two men kept up their attack on the side of the house. When the disinfectants came I tried

to clean the protruding bone but the pain caused the child again to lapse into unconsciousness, a fortunate anesthesia. I proceeded to clean the wound as well as I knew how, then I set the bone and splinted it with two pieces of bamboo. The child had recovered its senses and for the first time I relinquished my hold on him. The mother took it and offered it her breast.

I told the parents I would return with more medicine in the morning and warned them not to touch the splints. I walked off but soon found it necessary to stop and recover some degree of calm before returning home. For the moment my morale was completely shattered by the happenings. I was sick with regret at having been the innocent cause of the accident, and at having seen the suffering of the child and the anguish of the parents. And my fears for my own life had left me weak.

In the morning I returned with my medical kit. I was sickened to find that the splints had been removed and the bandage replaced by a mass of dirty human hair tied around the wound. The child was whimpering and moaning in a troubled sleep. Again I set the arm, bound on the splints, and threatened that we would have to take the child to the presidentia if the bandage and splints were not left in place. But unfortunately, by my next visit, the family had disappeared into the forest and it was many weeks before they returned. When they did, the child had recovered, but he had a shamefully crippled arm.

6. PLOW AND CARABAO

My house of Philippine mahogany was completed, but there was no evidence of the magnificent mahogany sheen one sees on fine furniture. It was covered with paint. The rough-hewn boards might have been of the cheapest wood known except for the fact that the termites could not destroy it. The house was anything but a palace. It had two reasonably-sized rooms, and a smaller one that would serve as the kitchen. Windows were square openings with wooden covers that could be propped up or lowered as the weather demanded, and were designed to carry away smoke from the open fire used for cooking. Unlike the houses in the village, the floor of this one was only three feet from the ground but this still allowed for sufficient ventilation to keep it dry.

The dormitory, too, was completed. Supplies had arrived by raft—necessities such as cots, blankets, and mosquito nets, and luxuries such as tin plates, tin cups, and cutlery had been purchased.

My houseboy was afraid to sleep in proximity to the great forest and its spirits, so each night he would go back across the river to town, and he urged me to sleep in the village too. Since the house was low and the windows open I did take the precaution of placing under my pillow of kapok (tree cotton), a kris (knife) about two-

and-a-half feet long, with a sharp sinuous edge. Now many of these knives have two sharp edges, but even with one it was a wicked weapon. You see, I wasn't as brave as I wished everyone to think, and I felt it wise to be prepared. I really was growing quite lonely and found it difficult to sleep; moreover, I was awakened by very slight noises, the python crawling in its box, a small forest rat foraging, or even a barefoot step on the path coming up from the river.

When this happened one particular night, I first thought the sound had come from within the room. I held my breath for some moments, all the while feeling the presence of someone else in the dark. My hand stole under the pillow until it encountered the hilt of my kris; then I waited, feigning sleep. The moon was shining and slowly there appeared against the open window the outline of the head and naked shoulders of a Manobo. The individual stood still watching my bed and my covered form. Since my cot was just inside the window, he would have had to lean through it to deliver an efficient blow. At that moment I might strike. I waited endless minutes for some overt move, wondering whether he was alone. Eventually the visitor turned and moved away from the window. I raised up slowly to see the shadowy form disappearing down the path. If curiosity was the sole reason for his coming, presumably it had been satiated. If he had come hoping to take a head, he had obviously decided to postpone the execution until a more propitious time—maybe he had been distracted by the call of a *limoccon*, the dove of prophecy. At any rate he had given me a fright that would keep me alert.

One morning I was again awakened unaccountably. I got up and began walking down the path toward the river when the earth under me began to wobble about a bit as if I were having an attack of dizziness. I was experiencing my first Philippine earthquake, one of a series that was to last for two months and would include more than 200 shocks (by official tabulation). I might explain here that the Agusan Valley is between two great volcanoes, Camaguin, located on a small island that we passed as we approached Mindanao, and Apo, which lay to the south about seventy-five miles as the crow flies. Their intermittent activities probably triggered the frequent earthquakes in this region. It must have been a preliminary shock that had awakened me in the first place.

The movement stopped and I had started to return to the house when another shock toppled me to the ground, and the house and dormitory began to rock back and forth drunkenly. There was an immediate commotion in the dormitory and boys began to spill out through doors and windows yelling "temblor" and other things I did not understand, while the rattling of the corrugated iron roof and the screeching of wood made a considerable din. Several boys had been thrown forcibly from their cots to the floor. And although all

had been through earthquakes none had experienced this, since they were accustomed to sleeping on the floor. The houses in the village swayed back and forth without incurring any distinct damage. I kept thinking that if this had happened in an American city it would probably have done great damage, for the brick and stone buildings would have fallen, and ordinary structures would have been wrested from their foundations.

The boys tried to explain the cause of the quake as best they could; a giant devil lived in the earth and when he turned over or had trouble with his wife, the earth trembled and moved. One of the boys who doubted my story of taking the moon out of the sky suggested that maybe I could keep the giant quiet as I was such a powerful man. I fear he was laughing at me.

During the morning I set the boys to clearing grass and weeds from a small plot that was to serve us as a baseball diamond, for baseball was to be one of the important courses in this school. I wanted the boys from the various villages to become friends and felt that teamwork might help.

When new boys arrived at the school, they all had to go through the same procedure. A Chinese tailor measured them for suits of khaki and issued them ordinary T-shirts and a pair of underpants. Then came a bath and a physical inspection. Some boys had skin diseases, various types of itches caused by small fungus plants growing under the skin. Others had infections from thorns or cuts in their bare feet. My treatment of the skin diseases was invariably an application of strong salicylic acid, a harmless substance that was very effective in destroying the fungus. The small wounds were washed and disinfected. The boys who had malaria were placed on a dosage of quinine. Most of the Manobo children were skinny, which suggested that their diet of rice and sweet potatoes was not adequate. I was planning to find out what would happen if corn were regularly added to their diet, since a poor quality of corn could be purchased.

On the day of the earthquake word had been brought to Eleoterio that his mother was dead. He asked for some leftover boards to make a coffin. When I visited their house sometime later, the women had begun the wailing signifying mourning. On looking at the woman in question it was evident that she was not dead, but merely unconscious, and at times she would murmur unintelligible sounds. She had been in this state for two days more or less, taking no food, and it was indeed a miracle that the spark of life still flickered in her. Everyone seemed aware of this but the priestess and others insisted that she was dead, that a devil had entered her body and was making them think she was still alive. They said the only way to get rid of the devil was to bury the body. From the odor one might well believe this,

I insisted, however, that they wait to bury her until the following day; then I returned to the school. The next morning I found that my arguments had been of no avail. She had been buried as soon as I left, chiefly at the insistence of the priestess. Of course she was now dead, and the devil in her body indeed destroyed.

The everyday tasks in the school were small, but one of the most pressing was the preparation of food. Two boys were assigned to the job each day. They had no objections to this arrangement since cooking was not necessarily the work of women; here the men preferred to carry raw rice with them when they left home and cook it themselves rather than eat cold food. The preparation of the corn involved considerable work. The shelled corn was placed in a wooden pestle and beaten with a stout blunted pole about six feet long. Thus the corn was not only broken up, but the tough husk around the grain was loosened. The broken grains were shaken and tossed in a flat woven tray and the grits winnowed from the husks. It was then merely boiled.

Corn was not entirely new to the boys, and it was to be the main item for at least one meal each day. The other meals would consist of rice combined with vegetables or yams or with green leaves from edible plants. Often we were able to purchase from the villagers vegetables and fruits, or a wild fowl, or fresh fish. Canned salmon was served once a day. After they became accustomed to it, the boys enjoyed the change in diet and it was interesting to see the effect the wholesome food had on them, especially the corn. Their skinny bodies and anemic brown skins began to look healthy and they even began to appear plump; they shortly became a sound and happy crew of youngsters.

Since my plan called for enrolling boys from all parts of the Manobo country, it was necessary to visit a number of the outlying villages on the western branches of the Agusan and in the upper reaches of the Bunawan rivers to try to recruit students for the school. I acquired a dugout canoe fashioned from the trunk of a large tree and sent the constabulary to find four men to serve as *grumetes*. I had erected a small canvas canopy over a part of the canoe to obtain some protection from the sun, and had prepared my collecting bags and specimen containers. My boy, Antonio, prepared the food we were to take, and saw that everything else was in readiness for the journey. We were to leave at daybreak on the following morning so that we might travel during the cooler parts of the day.

I spent part of the evening in the dormitory helping the boys who were struggling with the simple sentences contained in a first reader. I would read a sentence and they would attempt to repeat it in unison, over and over again. Then I would give them words not

in the book. After a time Gimeno interrupted and said, "Show us of the magic. When will you take the moon?"

I had told them I would take the moon on the following Thursday evening. "You shall see, if the raincloud does not hide the moon. You will see this happen."

"But sir, tomorrow you will go to the villages. How can you take the moon when you are not here?"

"You will see, Tiburcio, whether I am here or not I will take the moon. Perhaps I shall give it to the crab Tuda to eat and you will have to scare the crab away." There was much talk in the dormitory long after the lights were out.

Antonio awakened me at dawn and told me we could not start the water journey. When I inquired what the trouble was he said, "Manobo *grumetes* no go water journey. *Limocon* talk, no go. *Bibilan* say no go." The green dove had forbidden it and the priestess had relayed the message.

After my breakfast of millet, jackfruit, and coffee I crossed the river to town to find out why we were not to make the journey. It was as Antonio had said, the *limocon* had announced to the *bibilan* that nobody could go on the water journey that day and all of my own efforts to convince the *grumetes* to the contrary availed nothing. We would go on the following day. If we went today perhaps Mandalingan, their god, would make us die. It would seem that Mandalingan and his *limocon* were endeavoring to thwart my efforts.

The morning was spent with the boys in clearing some second-growth forest; I took a walk back into the forest where a great *balete*, or strangler fig, tree stood. It was locally known as the kitchen of the god Mandalingan. The tree was massive, with thirty or forty trunks ranging in diameter from six inches to perhaps three feet or more scattered over a somewhat circular area of more than forty feet in diameter. The whole was surmounted by a great, thick canopy of branches, reaching almost to the ground, covered by glossy leaves which hid its dark mysterious interior. It bore, at this time, small, tasteless fruits, for in fact its figs are to humans an inedible variety. But the fruit is the favorite food of the *limocon*; and it was usual for the *limocon* to call from this tree.

At the base of the tree near the path, I saw some bamboo cups which held a small quantity of rice, a small wooden tray containing numerous other miscellaneous objects, some betel nut and lime, and to prove that Mandalingan was an addict, one dry leaf from a breadfruit held two frayed cigarettes. I suspected that Antonio had himself placed them there. Doubtless they originally had come out of my pockets. These offerings to Mandalingan were put there by his devotees or by the *bibilan* herself. When food was offered, it was almost sure to be gone in the morning for the forest shrews, or the

tiny midget squirrels, not much bigger than mice, or the forest burrowing rats, or any of a dozen other animals would assist Mandalangan in accepting the offering.

The relative darkness gave one the uncanny feeling that ghosts might actually be hanging about, or that Mandalangan was hidden there, peering out with an all-seeing eye, surrounded by devils ready to do his bidding. Strangely enough the orchids, ferns, and other plants that ordinarily cling to the bark and branches of almost all forest trees were absent from the branches of this sacred tree. I confess that it was weird and ghostly.

In the late afternoon we played baseball. I scarcely need say this was not a regulation game of ball. A temporary bat was made from a branch, and the ball, also temporary, was fashioned from the fibers of the abaca plant, which were wrapped about a small stone and covered with strips of hide. My players were rookies. Most could throw rather well, but they would have done better with the javelin, having already had considerable experience in throwing spears. Later on, we did acquire a baseball and bat from Manila.

In the evening I became concerned about the eclipse. The boys were somewhat excited about what I had told them, and they had also talked to the *bibilan* and to some of the townspeople about it. After dinner I again checked my old newspaper to verify the eclipse. I had gone to the door a number of times to watch for the moon, and when it finally appeared above the top of the forest, it was blazing in full glory. Shortly thereafter, though, Antonio came in and said, "People by river—moon going away!" Sure enough, the edge of the moon was showing a small black indentation. The eclipse was indeed beginning.

The boys came out of the dormitory frightened and puzzled. Was it only the crab that was eating the moon or did the Maestro-Americano have something to do with it? Had I got the crab to come this time? Some of the boys had seen this happening before, but most had only heard about it, since they usually retired too early to see an eclipse or lived in an area where prevalent clouds or the forest itself hid the happening.

The crowd from the village on the opposite bank of the river grew until practically the whole population was there. The men were yelling and shooting bamboo arrows in the air; the women were holding their crying babes. "*Tuda, Tuda,*" they shouted as the darkness covered more and more of the silver surface of the moon, and they sped arrows toward the moon to chase the crab away.

"*Tuda, Tuda,* go away, go away!" Still more arrows and still the moon continued to disappear; more arrows were brought. The schoolboys got their arrows and shot them from our side of the river. When the moon finally disappeared completely there was consternation indeed. Usually the cries and arrows would have

caused the crab to spew out the moon, but now it was completely gone. I assured the boys that I would make it reappear, and after a short time a tiny rim of silver did appear; it grew larger and larger until the great fat body of the moon was again placidly gleaming in the sky, while the crab crawled back into the cavern of space.

7. DRAFTING STUDENTS

We were up and on our journey early next morning; the *limocon*, if it had called, had used the proper notes and the journey was to be auspicious. Two of the constabulary were to accompany me. Our plan was to ascend the Bunawan River for two miles to a small natural canal that ran ten or fifteen miles through the forest and connected with some lakes through which the Agusan River flowed. The lakes had been formed within the memory of the old men when a great earthquake had caused the land to sink in this region, and the depression had been filled promptly by the Agusan River.

Along the narrow channel, the banks were lined with a wild variety of a grass resembling sugar cane. There I found a species of small, shiny lizard with a brilliant red tail. The undersides of their toes had tiny overlapping scales that allowed them to cling to the smooth stocks and leaves of the canes. I recognized them as a species of *Emoia*, which I later named *E. ruficauda*, and collected several. A handsome, slender, green snake with a snout pointed almost to the sharpness of a pencil was also taken. This was *Dahun palay*, the rice-leaf snake, thought by the people to be deadly poisonous. Although there is some poison, which is sure death to small frogs and lizards, it cannot kill a large animal or a man; however, when I caught the snake, I held it so it could not bite.

We drifted with the current through the many channeled routes, for here currents separated into different channels that reunited below. Looking ahead I spotted a crocodile lying on the bank at some distance, but since I thought we might pass by the spot without disturbing it, I said nothing to the *grumetes* or the boys. When we were nearly opposite the crocodile, I suddenly heard movement and yelled "*buaya*" as its great body plummeted from the bank to splash water on us. Two of the men jumped into the water and swam a few strokes to the other bank of the narrow channel. We drifted down to pick them up and while the dripping *grumetes* again took their places in the boat Antonio sagely remarked that they were "jumping in crocodile's nest to escape crocodile."

Having come opposite the mouth of the Waloe River, which entered the Agusan from the west, we now started up against a current. The river was running high, and we camped at a place where the falls made it necessary to leave our boat. When everything was in readiness for the night, I took the lantern and went

collecting along the path that led to the villages of Sagunto and Waloe. Only a few frogs were obtained.

The following morning, the two constabulary men found a guard for the boat and we set off for the western villages on foot. We traversed the path through the forest to the village of Sagunto. There *Dato Pada* received us saying he had no son of the proper age but we might take the son of his brother who was perhaps fourteen years old. The boy, Basilio, was sent for and he appeared dressed in his finery. He wore loose whitish trousers, highly ornamented with red embroidery and decorated with bright red fringe at the bottom of each pant leg, and a very short jacket, open in front. His long hair was rolled along the sides and tied in a knot on his neck. He had gold rings in his ears and wore bracelets and anklets of black woven fibers. He was certainly picturesque and might even have been called handsome except for the wad of *buyo* in his lips and for his blackened teeth. While Tuburcio talked to him, he looked rather enviously at Tiburcio's trim khaki trousers and his coat cut with a stand-up collar, such as soldiers formerly wore in the U.S. Army. Tiburcio was a good salesman and told Basilio of the wonders of the school and of the most extraordinary Maestro Americano who was master over *sawa* and animals, and who said he was able to kill people without a gun, and who could have the crab take the moon! He also promised the boy a fine new khaki uniform like the one he himself was wearing. The young man said he would give us an answer when we came back from the next village.

We pushed on to the village of Waloe and found the people there suspicious. This town was subject to the outlaw *Dato Taoidi*, and his son was supposed to be living in the village with some relative. I did not inquire at first about this boy, but asked about another young man, Pedrinka, son of one of the *bigganis* (men famous for their prowess in headhunting). Pedrinka was sent for and, after some thought, said he would come to the school. Tiburcio had told him about me, saying that I was not afraid of *sawa*. It seemed that Pedrinka was not afraid of anything either. He was very brave; he had killed three men. How many had the Americano killed? Yes, he would come to the school, but he would bring two other boys who, although not exactly his slaves, were required to do his bidding. When we asked about Taoidi's son, we learned that he lived there but could not be found. We left word that we expected him to accompany Pedrinka to the school. At a later time he sent word that he would only come to kill the Filipinos and the Americano and the soldiers who wanted to punish his father. In the fighting the soldiers had killed some of the friends and relatives of *his* father. Through an intermediary I sent word to Taoidi that he must surrender to the constabulary so peace could come to the

country. I stressed that he must send his son to the school with Pedrinka.

On our trip back through Sagunto, we learned that the father of our prospective student had agreed to send Basilio to the school. We found our dugout, boarded it with the *grumetes* and guards, and started upriver along the Bunawan. We passed the canal entrance and made our way to a point opposite another settlement in the forest. With Tibureio and Antonio, who carried food for our immediate needs, I left the boat and sent it back with the constabulary and the *grumetes* to Bunawan. We would obtain a canoe and leave the town by a branch of the Agusan that ran near the village.

I wanted to make an unannounced visit to the village of *Dato* Badao. Previous attempts by the governor to see that *dato* had been thwarted. The people left the village and hid in the forest, probably because the governor had arrived with an armed patrol, and the inhabitants feared they were under attack.

We did not know just how far Badao's village was from the river. The two boys with me were afraid, and they wanted me to return with the boat; but since I was determined to make the journey, they reluctantly came along. We were uncertain whether we had been observed and hoped to appear suddenly, before the villagers had time to leave. We were soon aware that our presence was known. A native began beating with his club on the buttress of a forest tree, telegraphing our arrival to the village. Tibureio translated. "Stranger come, big boat with soldiers. Soldiers, boat, go away, Stranger in forest, two saecopic."

Tibureio then found a small club and utilizing a large buttress, himself sent a message. "Friend, friend, come visit Badao. No spear. No gun. No soldier."

Tibureio sent the same message two or three times, but when we finally came to the village, not a single person was to be seen. All had left the town, even the dogs had been taken. Tibureio went up to several houses calling, "*laki*." At last he discovered an old woman, too ill to be moved, and perhaps ready to die anyway. She was, I believe, the sister of Badao's father. The boys told her that a school was being made, that we wanted as students one or two boys, the sons of Badao or of his *bigannes*. I also left with her a message for Badao. I explained I had come as a friend with no constabulary and no guns. I told her I wanted Badao to come to Bunawan to talk to the governor and negotiate a peace. Moreover, we wanted him to bring one or more boys to the school. She said her people did not want to be friends, and might kill us as we left the village.

We were in a quandary and became aware that our coming had been a mistake. We knew a small branch of the Bunawan River ran close to the village, affording possible escape. We descended from the house, pretended we were starting back to the Bunawan River,

then disappeared into the brush and circled in the opposite direction toward that branch of the Bunawan. At last we found a small dugout canoe, appropriated it, and started drifting downriver toward the upper reaches of the Bunawan. We had no oars, but by holding a stick at the back end of the canoe it was possible to guide it. We did not stop for our evening meal but continued drifting on the slow current for some distance. We pulled the boat up out of the water to wait for darkness, when we would drift on downriver to the school. After about an hour we felt reasonably certain we were not being followed. We then cooked rice and ate it as we drifted down the river. We passed two other friendly villages in the night; at one, we left our canoe, arranged for it to be taken back upriver, and purchased another to continue our journey. The current was fairly strong and we reached Bunawan sometime after midnight.

On our return we found everything placid, but the supplies that usually came twice a month had not arrived and there was a shortage of food in the school as well as in the village of Bunawan. I knew the boys could find food in the forest, so one group was sent to hunt for *obud*, the end growth of the trunk of certain kinds of palms. Many are rather bitter but, with proper boiling, become palatable nourishment.

I sent three boys in the canoe to visit the clearings along the river to see if we could purchase vegetables, coconuts, and *saguing*, which is Manobo for banana. With the remaining boys, and our axe, I went into a partly cleared area and began preparing it for a vegetable garden. The boys trimmed away the shrubs with their bolos and the few small trees were cut down with the axe. The brush was piled on poles and removed. Usually, when the Manobos made their clearings, they left the trees just where they fell and would burn them when they were dry. At this season of the year, however, it would have taken months for the brush and trunks to dry sufficiently to burn.

In the afternoon the food hunters returned with a sufficient quantity to keep the boys in food for three days. Surely the supplies would arrive within this time. Indeed, the evening of the third day the launch arrived with a half-month's supply of rice for the school and some for the villagers, as well as with axes, saws, and even a plow for the school. There was now no immediate threat of a famine. I also received my first lot of mail from the States. I had almost forgotten such things as daily newspapers existed.

8. STRIFE WITH MANDALINGAN

The following day we were actively engaged in clearing the land. I taught the boys how to use the saw to cut down trees, and three of the older boys learned to use the axes. I confess I expected them

to injure themselves, and one boy did hurt himself somewhat by kicking his foot accidentally against an axe blade.

I mentioned that we had received a plow, made by a Chinese "manufacturer." We fashioned a harness for the carabao from braided rattan to replace the old ropes we had been using, and a new singletree for attaching to the plow. Long before we had the whole field completely cleared we began the plowing. Now, plowing in an open field with horses or a tractor, and a good plow, may be fun. But I assure you that with a water buffalo named "Slowpoke," and a plow made by the Chinese at Butuan, to work in a field of green stumps and soil that had never been plowed was not fun! It was a gigantic task.

I was plowman. Scarcely would Slowpoke start before the plow would be caught in a tangle of roots. Then we would have to back up and start again only to get stuck in a soft green stump before the animal had walked a dozen steps. One had to have the patience of ten Jobs. Our plan was to work in shifts, the carabao being given a rest about every two hours. She was led to the river and allowed to lie in the water. Once a crocodile attacked her and injured her right rump. But crocodiles or no, the carabao needed those breaks or she would have been unable to work well.

The clearing of the land was wonderful for my collecting. In the morning the boys had found a *magatilocock* (*Tarsier*), a strange midget of a primate with a body about five inches in length, and long arms and tail. Its eyes were relatively huge. There were flat nails on the thumb and first finger of the hand, and on the first three toes. On the other digits were typical claws; one flat fingernail had an incipient claw in its middle. I realized that, as a primate, this midget was probably man's smallest living relative.

At least five or six species of terrestrial lizards, certain arboreal geckoes, and three kinds of snakes were collected. Of the last, one was a blind *Typhlops* found in a hollow within a small, severed tree. It was a puzzle how the snake had found entrance, unless from underground. Another snake (*Haplopeltura boa*) had fallen from a small dead tree that was covered by lichens and mosses, and, indeed, the coloration of the snake gave much the same mottled appearance as the lichen-covered branches. It had remained motionless after its fall, in fact practically rigid, feigning death. In this condition, it was picked up.

This spot was visited again at night. Under the tree was a long-accumulated quantity of dead branches. Moist, they gave off a phosphorescent light, suggesting a mass of burning coals.

Work on the farm progressed, and after some weeks the land intended for the cornfield had been cleared and plowed. There remained many low stumps, a few high ones, and the great, spreading *balete* tree that stood near the center of the field, shading part of

the cleared land and monopolizing a great area for its own needs. With the removal of the surrounding trees more birds seemed to congregate in it and the prophetic *limocon* called ominously and frequently.

The last visit of the launch from downriver had brought us a fine young Poland China boar, which the Bureau of Agriculture in Manila had obtained for us from the Hawaiian Islands; we hoped to improve the local breed of pigs, which were really stunted half-brothers of the wild boar in the forest. In the same shipment our corn seed arrived, obtained by the bureau from a foreign source that I could not learn. I have never seen more beautiful corn. The ears were large and shapely. The grains were the color of pearl, and on the cob the neat, regular rows suggested nothing so much as a series of pearl necklaces laid side by side. If we were successful in raising corn in Mindanao, we were to return a quantity of the homegrown seed to the Bureau of Agriculture.

The study of baseball had also progressed, and the new boys from the western villages had arrived and been outfitted with khaki uniforms. The day before their arrival, I had found a handsome spreading cobra (*Naja naja samarensis*), in the garden patch and numerous other snakes and lizards had been taken as the brush piles had been dragged away. Some snakes, more *Typhlops*, had been unearthed during the plowing. Three species of small lizards had moved into the house and could be seen at night running over walls and ceilings, chasing mosquitoes or moths, or fighting or courting each other, the activity ever accompanied by their calls. Our daily lives appeared to have settled into a routine, until I undertook to disturb it.

Early one morning I was out in the fields before breakfast and began considering the wisdom of removing the *balete* tree, Mandalingan's kitchen. The usual small offerings to the god had been placed there by the people in the village or by the boys to assuage his wrath or to beg some favor. Three *waks* (large black ravens) that had been assisting Mandalingan by eating rice grains from a tin can flew away scolding, "wak, wak, wak." I looked at the ancient tree for a time and recalled its strange method of growth, for the tree is indeed a strangler, a murderer. The *limocon* that feeds on the fruit does not digest the hard seeds of the figs; instead, the bird may deposit them high in some great forest tree where the seeds can find root. The new tree gets its nourishment from its host by thrusting roots through and under the bark, which begin growing down to the ground, often fifty or more feet below. More roots go down until the trunk of the host is surrounded by a heavy network of trunks and roots that grow constantly stronger and tighter. From its now-spreading branches, the *balete* lets down small floating roots to grasp the earth. In the meantime the roots steal the sap from the host, and

the network on its trunk becomes a mass that may cover its whole surface, strangling it with deadly tenacity until the host is finally killed. Many years will pass before the standing mummy of the giant finally decays and disappears. As if gloating over its kill, the *balete* will continue to put out new branches and develop other new trunks which the years find growing ever thicker and stronger, thriving and fruiting, now serving the god, Mandalingan.

I decided that I would cut the strangler fig, and remove it from the land, Mandalingan or no Mandalingan. There was no reason aside from superstition to leave it there, destroying the productivity of my field. I announced to the boys my intention of cutting the tree.

Basilio said, "But Mandalingan will dead you very hurry."

And Tiburcio said, "The people will very angry and Mandalingan make revenge; we are very afraid."

But I said that I was not afraid of Mandalingan and that he could easily find another kitchen. I asked if any boys wanted to help cut the tree, but only Pedrinka, the headhunter, volunteered. In Manobo he shouted he was not afraid of Mandalingan or his devils, and he would help the maestro cut the *balete*.

We took two axes and began the task of cutting the multiple trunks. The wood of this tree is very soft and offered little resistance to our axes; the "blood" of the tree was a pure-white, sticky latex. Pedrinka, to bolster his courage, kept repeating he was not afraid every time he severed a small trunk.

When the townspeople learned we were cutting the tree, they remonstrated. They feared Mandalingan would punish them if I continued and that I too would be killed by the god, but the cutting, once begun, was to be finished. The people stood about in sullen groups; the boys forgot their assigned tasks; they thought my power must be great to defy the god.

By evening the last trunk was severed. I of course had expected the tree to topple over, but it refused to fall. Some of the boys were greatly excited and went to their dormitory calling back to the others, "*Dali Dali mala ad tao*" (Hurry, hurry, or you will be lost men). They barred their doors and fastened the *media aguas* over the windows. Antonio, my house boy, reported he was sick and must go to the village. I waited a while by the *balete*. The tree in growing had balanced itself quite perfectly. I began making cuts from the lower parts of the severed trunks, but, while I was able to get some movement, when darkness came the tree was still standing.

I cooked my own rice, heated my own can of salmon, and dined alone under my mosquito net canopy. I began to question the wisdom of what I had done. Pedrinka had shown no fear except when the *balete* had refused to fall over, but then he too went with the boys, no longer boasting. Mandalingan is holding the tree, he had shouted in Manobo. The village people had stood in groups on

the opposite side of the river in the evening, talking and gesticulating. Something dreadful would surely happen. At dark, I closed my doors and windows against guests visible or invisible. I desired no visitors from the village. Was I anticipating a visit from an invisible god or devil? I could hear a babble of voices from the dormitory but I did not go to quiet the boys. I tried to read but I felt uneasy and apprehensive. Not because of Mandalingan, to be sure.

When I looked at the matter from another viewpoint, I became even more apprehensive and felt even greater misgivings. What would a community in America think if vandals took axes and chopped up an altar in a church or otherwise destroyed it? Sleep would not come as the night passed. There was still noise in the dormitory. I tossed about, tried again to read, and then returned to my bed. Sometime near daybreak it began to rain, a breeze sprang up, and I heard a great crashing and smashing as the tree finally toppled over and "gave up the ghost."

In the morning I went out to view the fallen tree. There was still a great amount of work to be done in cutting it to pieces and dragging the dismembered body to the river. We could not wait until it was dry enough to burn. Moreover, the captured plot of ground would have to be plowed. Already the villagers were looking across to the clearly visible field and the tree. The boys, too, returned to the field, their courage apparently revived when the sun came up. Even Pedrinka was boasting again and was quite ready to help in the cutting. I lost much of my apprehension and, when some of the villagers began bringing occasional gifts of fruit or vegetables, I suspected they might be trying to gain a measure of favor with me. They still believed that I would be punished, however.

By the third day most of the tree had been taken away, the plowing well started, and much of the prepared field planted. With hoes and a homemade harrow constructed of bamboo and hard wood, we had smoothed the plowed areas and planted corn. The boys said there should be ten grains of corn for each hill, three for the birds, three for Mandalingan, and three or four to grow; but I set a limit of three grains per hill, and the corn hills were spaced.

On Sunday I took my usual jaunt into the forest. Three days later the boys reported that the *wak* were stealing the corn. When we visited the field a large flock of ravens rose and flew to the other side. We drove them away, but the next morning at dawn they congregated again and were following the rows of seed. The birds had been clever enough to discern the exact places to find the planted grains. The boys said they would make traps, and a large number were put in the field. But the ravens were smart birds, and not one was caught. Finally, we placed a series of guards in the field for

two-hour periods during the day to keep the birds away, and all day long they could be heard scolding from the forest trees bordering the cornfield.

We waited several days for the growing corn to appear; but only an occasional plant could be found instead of the thousands anticipated. Almost all the seed had been taken. The boys pointed out that Mandalingan had sent the ravens to take his share of the grain; they had also taken ours. We replanted.

At lunch one day a boy whose duty it was to care for the young Poland China boar reported that "*baboi* very dead." When I wondered at the cause of its death the boy at once suggested Mandalingan, but I noted the throat was swollen badly and began looking about the pen for a snake. Lying in the shade of the trough I found a deadly *haguason*, a cobra, that on seeing me raised the anterior part of its body and spread its neck regally. Here indeed was the guilty party and, whether or not he was an emissary of Mandalingan, he soon was another specimen in my collection.

Curiously, the same day, Maria, the woman Antonio had found to launder my clothing, was beating the wash on the smooth rocks by the river when she was bitten by a snake and ran screaming to her house nearby. Her companion killed the snake and carried it to her house as evidence. Someone else came across the river to tell me that Maria had been bitten by an *haguason*. Aware that it was probably too late to help, I went to her house and found her lying on the floor, moaning. The women who had come from the neighboring houses were saying in Manobo, "She will die, she will die."

In the yard I had noticed the snake that had bitten her and realized that although in some ways it mimicked the poisonous cobra, its bite was harmless, in fact no more dangerous than a scratch from a thorn. I took the dead snake in my hand and informed the onlookers that I could cure the bite. Maria need not die. Turning to a corner, I removed a part of the animal exposed by the beating, and, screening the bitten foot from view, I applied this to the wound. I shook Maria.

"*Madadjaoa*," (good), I said to her. "Good now. No more pain yes? You will not die, Yes? You feel very good now, Yes?" I took her by her arm and lifted her to her feet. "See," I declared to the people, "I have cured the bite of this snake," and started laughing. Soon Maria was also laughing. I gave her a slap on the hip and told her to be about the business of washing my clothes. I told her that Mandalingan would not send another *haguason* to bite her. But he had sent the one that bit the pig, and it had died.

The place where the kitchen of Mandalingan had stood was now a part of the field of growing corn, interspersed with stumps. After the third planting, we continued the shifts of guards in the field from daylight to dark, and our stand of corn flourished, growing as if by

magic. The great *balete* back in the forest, the palace of Mandalingan, was as forbidding as ever, though, and a visit showed the evidence of numerous recent offerings. Almost every night from across the river the sounds of the bronze *agongs*, struck by hand, accompanied the *bibilan* in her worship. The boys in the school, moreover, seemed to regain their exuberance and scarcely a day passed without their playing a game of baseball. It was the custom to choose two captains by lot, and then have these choose alternately the men for their teams. Thus, no stationary groupings or cliques were formed and the boys were becoming great friends. Even Pedrinka was becoming more of a "boy" than the warrior he was when he first came to the school.

One evening in the dormitory Tiburcio gave me a more-or-less complete account of the gods, as he knew them. There were many. First in the minds of the people was Mandalingan, who had a wife named Daraga. She stayed in the background and played little part in the lives of the men, but the women sometimes prayed to her for small favors. Only the *bigannis*, the warriors, could speak directly to Mandalingan, since he is the god of the *pangayao*, the headhunt, and of the important concerns of men. There were other more ancient gods, Lamakin, who made the hills and mountains; Akonkis, who created rain clouds and the waters of the land and sea; Akakoren, who made the air and the sky. But Mandalingan made man, and Daraga his wife made woman. I could not learn whether these gods were equal, but I believe Mandalingan was supreme. Like all primitive folks and others, the people do not ask who made the gods, who created them in the images of men, with their foibles, their weaknesses, and their emotions.

I found that Mandalingan is easy to anger if his pride is offended; he can hate; he is jealous; he demands respect; he must be worshipped; he carries weapons; he may fall in love with women and become the father of their children. He frowns, he punishes mortal men, and many of his bodily functions are those of men. His food is spirit food and the souls of animals. He can cause the death of mortals, but will listen to reason, and his affection and good will can be purchased by good sacrifices.

Mandalingan had some lesser deities who assisted him. One was in control of the harvest and planting; another was interested in procreation and birth; another was in control of the lives of animals. There was also wicked imps or devils. They made you lose your way in the forest, stole your bolo, tripped you and caused you to fall, and led you into deep mud in the swamp. The *busao*, giant devils, made a tree fall across your path, and picked up people and placed them in forest trees or hid them in holes in the cliffs until they died. Then they ate them, and left only their bones. Unless certain ceremonies were observed, they exhumed the dead from graveyards and

feasted on putrid flesh. Houses could become bewitched if a *busao* took up residence. Then there was Tuda, the crab that ate the sun or moon, and Balogan, the earthquake-maker.

9. MANDALINGAN'S REVENGE

The corn grew superbly, all but hiding the unsightly stumps. The ears began to grow fat. One morning shortly after dawn there appeared flocks of cockatoos (*Cacatua*), great white members of the parrot family, each with a large greenish-yellow crest on the top of the head, scolding and shrieking their delight. They alighted on the corn and began tearing open the ears to get at the soft, luscious grain full of milk. The boys and I ran to the field and drove them away, but more and more of the birds arrived. Men were stationed in every part of the field, and with shouts and sticks the cockatoos were scattered. Some flew to the forest fringe but others alighted on the palace of Mandalingan farther back in the forest. Again, a watch was set from dawn to sunset, at which time the marauders would return to their roosts in the trees growing from the sunken lakes in the forest.

After the planting, a fence had been built to keep wild boar out of the field; but one night they broke it down and destroyed a few stalks. We reinforced the fence and along the path worn by the boar, we dug deep pits. Over the openings we placed carefully camouflaged covers, and in the bottom of the pits a series of sharpened spikes of bamboo. No pigs fell in the pits, but they continued to patrol the fence on one side. One morning other visitors, three deer, were found in the field, having leaped the fence with ease, but, being chiefly browsers on leaves, they did less damage than might have been expected, and when surprised escaped from the field as easily as they had entered.

Obviously, guards would have to be kept in the field night and day to scare creatures away, so we hit upon a noisemaking scheme. In the middle of the field we built a shelter on bamboo poles; at various places throughout the field we drove single bamboo poles into the earth and suspended from each an empty five-gallon gasoline can in which a clapper was fastened. From these poles we ran rattan lines to the central shelter. Thus, by pulling the several lines, one man sitting in the middle of the field could produce a loud and threatening noise in any part of the area. The boys, in teams of two, took turns standing guard during the night. At first they were afraid, but when the maestro stood the first watch alone, they did not want to seem more cowardly.

Thus the night marauders were thwarted, but then a new menace appeared. A boy reported that ears of corn were missing from those stalks along the edge of the forest, and under nearby trees we found the husks and cobs. Monkeys had come to harass us.

These creatures would perch in the trees, remaining silent, watching the guards as they patrolled up and down the field. As soon as a guard passed the place of concealment, a wretched little mimic of a man would run from a tree, climb over the fence, seize an ear, and return to a silent gang of thieves still in the trees, there to husk the ear and gnaw the succulent grains of corn. We redoubled our watch, for the corn was hardening, and it would be only a short time before it would be ready for the harvest.

Then, without warning, one of the boys, Gimeno, became ill with some lung infection, and he was very ill indeed. I moved him into my quarters and remained with him practically all the time. I had been warned by the governor that no boy should be allowed to die at the school.

I do not know the name of the illness, but I strongly suspect it was pneumonia, or something similar. This was no case of a harmless snakebite; the boy ran a high fever and had great congestion in the lungs. I was almost certain he would die. It was no satisfaction to hear the other boys remark that if Mandalingan killed Gimeno, his father would kill me. They feared too that Mandalingan might take them next. But Gimeno eventually recovered, and this represented another victory over Mandalingan.

The next trouble was the truancy of two boys from the school. Presumably they had returned to their homes, frightened at the prospect of punishment for helping remove the god's kitchen from the field. I could not permit desertions, so as soon as their absences were reported, I went to alarm the constabulary and to send them for the boys. The able men, however, were away on their regular patrol and I had to go myself. Gimeno had recovered to a point where I could leave him with my houseboy, Antonio. I called Tiburcio from the field, sent for a carrier, and with food and collecting equipment, prepared to set out to round up the deserters. The *limocon*, fortunately, had obliged with the propitious calls in the morning.

The missing boys had left the dormitory very early in the morning, taking some ears of corn for food. They had "borrowed" a tiny dugout canoe lacking outriggers and scarcely capable of supporting the weight of the two men, but both were expert oarsmen. The first part of their journey would be down the Bunawan River for about fifteen kilometers. Then they would have to leave the water highway and take an obscure game trail through the forest to the village of Lubangon, if, as I felt certain, the boys intended to return to their own village.

We were soon on our way. With two oarsmen in a medium-sized dugout canoe with outriggers, Tiburcio and I started downriver to follow the presumed course of the boys. The current was strong

following heavy rains, and in a relatively short time we reached the place where we were to begin the overland part of the trip.

One of the oarsmen had been over the trail and said he could find it, but until we finally encountered it, after crawling through the mass of wild sugarcane on the river bank, I had my doubts. No canoe left by the boys was visible, but I was certain they would have hidden it carefully. The first hundred yards or so of the path was reasonably clear. Then it was mudhole after mudhole interspersed with stretches of water a few inches deep. Progress was slow, excessively slow, and laborious. The path was so overgrown that we could move forward only by bending low and pushing through the undergrowth. We saw no trace of our boys. After traversing a distance of possibly two or three kilometers, we found another dim trail entering our own and, shortly, the fresh footprints of two humans mixed with the tracks of pig and deer. We had in fact guessed correctly—the boys were on their way to their village.

Soon we entered a section of the forest where the rattan palms were numerous and their great, thorny, whiplike leaves were constantly catching at our clothing, as if attempting to hold us back. One caught at my cheek and ear, leaving deep scratches. The path began to climb over low foothills and, while there was less water and fewer wallows made by wild boar, we encountered slippery clay soils that still made travel difficult, and what was as bad, armies of leeches.

Some of you may have found a bloodsucking leech on your body after a dip in a swimming hole, and perhaps observed how its rubbery body expanded as it filled with your blood. Here on the ground leeches were present by the thousands, and, in places, the movement of these creatures as they inched their way like a tiny army suggested that the whole earth was moving.

I, of course, was reasonably well protected with shoes, puttees, and good clothing, but our guide wore only very short trousers and was barefoot. Tiburcio also was barefoot with his trousers rolled up. Time and again they stopped to scrape the leeches from their legs, leaving dozens of tiny wounds slowly oozing a little blood. I feared we would have to turn back, but finally in lower and wetter ground we left the leeches behind. We stopped and prepared lunch, getting our drinking and cooking water out of the trunks of rattan.

Late in the afternoon the path became much better and we soon approached our destination. Our coming had already been announced, as some native had seen or heard us and had used the forest telegraph to tell of our arrival. We were received by the *dato*, the father of Ubigon, and learned the boys were with their parents. I told him that we had come to visit the village, that his son had come for a short visit, too, and that we would all like to return to Bunawan the next day. The boys were surprised that no word of

punishment was mentioned. When I asked them if they would be ready to go the next morning, they said they would.

The *dato* was pleased by his son's appearance. Unlike the skinny boy who had left for school some months before, he was now as plump and chubby-cheeked as a corn diet could make one. The night was uneventful and on the following day we started back to the school at Bunawan, unfortunately meeting the same difficulties as on the previous day's journey.

Things had gone very well at the school during my absence. A young boar had fallen into one of the pits by the fence and a boy had caught two jungle fowl, *Gallus*. Even those wild ancestors of our common chickens wanted to be in on the harvest; they could be heard in early morning as the cocks raised their high voices in a cock-a-doodle-doo. And the monkeys, deer, cockatoos, and occasional groups of *waks* still threatened the corn.

But at last the corn was cut. The ears were left on the stalks, which were stripped of leaves and tassel. When the corn was dry, I selected a quantity suitable for seed. Several dozen of the most beautiful ears were culled out and packed away in containers impervious to rain and rats.

The boys and the people in the village marveled at this corn. I may say that I too marveled at it. Each ear was a masterpiece composed of pearls. When the next upriver launch came, the specially chosen ears, each wrapped in dried banana leaves in turn wrapped in a mass of fibers from coconut husks, and packed as carefully as fine glass in a heavy box, started on their journey to the Bureau of Agriculture in Manila, to be placed in competition for fine agricultural products at the National Carnival.

Every boy felt that he himself had raised the corn. In fact, every boy had, and probably no corn in the world ever owed so much to so many! To say nothing of our debt to the old carabao, Slowpoke, who had sacrificed the side of her rump to the crocodile, and who, like the rest of us, had defied Mandalingan by dragging the desecrated remains of his kitchen to the river.

We started the plowing all over again, but one Sunday I decided to take a day's vacation and returned to the great, tabooed forest. I took a series of collecting sacks because I intended to try to find some new kinds of snakes and lizards. Deep in the forest I forged my own paths, blazing a tree here and clipping a branch there. As I got farther back into the forest the ground became a little higher and the undergrowth somewhat less dense. I turned over a log and found two fine rough-scaled lizards (*Tropidophorus rivularis*). Other logs yielded additional species of lizards; and another, two small harmless snakes (*Typhlops braminus*). I climbed into the trees and cut down masses of orchids or great bird's-nest ferns; then I proceeded to chop the roots to pieces and managed to evict two common snakes and

several specimens of a tiny lizard (*Lepidodactylus*), scarcely larger than a kitchen match. Passing another large forest tree, I dislodged a strip of loose bark and a snake, quite new to science, fell to the ground and began to uncoil. Once having discovered the bark habitat, I began to pry off loose bark wherever I found it and took several more snakes of the same kind. Near an accumulation of trash close to the base of a large buttressed tree, I found several specimens of a glassy smooth lizard (*Brachymeles*). And, while prying off yet another piece of bark, I was startled by something gray that flashed past me on its way to the ground. I finally located the object, the gray now black, and the animal revealed was a curious, soft-bodied lizard, a variety that also had not been taken by any scientific collector (*Ptychozoon intermedia*). Tiny, winglike flaps were on each side of its face, other broad winglike expansions were along the side of its body, a similar flap bordered the back of the thigh. The long tail had a series of frills on each side, as if scalloped lace had been sewn on the sides for decoration.

I then lunched on cold rice and a tin of coconut milk. Weary from overturning countless logs I fell asleep but, upon awakening, noted that I had developed a headache. Nevertheless, I climbed a tree and continued to cut plants. Suddenly a handsome green-and-red pit viper crawled out of a plant mass. In my excitement I dropped my bolo and found myself in a rather precarious position on the limb. As the snake approached me, I brought my hand down quickly on its head, thus effectively preventing it from opening its mouth. Then with considerable care I moved my other hand up the neck close to the head, picked up the uninjured snake without danger, and dropped it into the collecting bag tied to my belt. Perhaps it was a foolish thing to do, its bite being dangerous, although not necessarily deadly, but it was a calculated risk and I wanted a perfect specimen.

It had clouded over and had begun to rain. I took shelter under some large arums, whose leaves served almost as well as an umbrella. I realized that in the excitement of my success, I had failed to mark my path and thus had to find my way back. I had slept much longer than I had thought possible after lunch and it was obviously quite late. I must have been miles from the school; nowhere could I find a trace of where I had been. I was feeling very miserable. There were pains in my legs, and the headache was worse. I was feeling so weak that panic overtook me.

When I finally came to my senses it was dark. I had been running and my clothing was torn. I had a number of deep scratches from rattan on my shoulders. The collecting sacks were gone. I wondered if I was insane. What had been happening to me? I forced myself to sit on the wet ground. I must stay here for the night. I must not

move. I was uncertain of directions. I was very ill. Rain began again and flocks of mosquitoes were crowding around. I must sit here, and I must not move.

I dozed off and when I awakened the rain had stopped; in the distance, off to the right, I heard a faint sound of *agongs* and *ganzas* that accompanied the *bibilan's* conversation with Mandalingan. Apparently I had been wandering in a semicircle and was not far from the river. I laid a branch on the ground pointing in the direction of the sounds, the direction of the river and the village, and relapsed into sleep or unconsciousness. The next thing I knew the sun was shining, and I heard nearby the sound of wood being cut by a bolo. I marshaled my strength and called out. I staggered to my feet, fighting pain, and started in the direction of the sound. How far I moved I do not know but I continued calling for help. Then blackness.

When I became conscious once more, two Manobo farmers were standing near me. They had heard me from their small clearing near the river and had found me. I told them I had malaria, not a dangerous illness, and they must take me to Bunawan. One got on each side of me and lifted me from the ground. After some painful steps I blacked out.

The men got me into their canoe and returned upriver to my house, where the boys helped them carry me to my cot. They cooked some rice and left it near the bed. Then they promptly left the house. They knew why I got lost in the forest, and why I was taking more punishment and would probably die. All activity stopped as everyone waited to see the effects of Mandalingan's anger. The boys kept to their dormitories, and the villagers stood about on the river bank. There was no work; there was no baseball. Tiburcio took a package of cigarettes and some corn and placed it at the palace of Mandalingan in the forest; and the boys would peek in through the windows to see if death had come. During this time I was conscious off and on but the pain seemed unbearable and darkness would again return.

Four days had passed in this manner when a constabulary patrol, coming from Davao in the south to Butuan, was passing the village on its way down the river. One American traveling with the group learned of the illness of the Mericano and stopped to help. After giving me much-needed care, he fixed a bed of sorts in our outrigger canoe and transferred me to the craft. Taking two men with us to return to the school, we started floating down the river.

It was a curious awakening. I saw the trees passing in steady succession. Was this some amazing dream? But no, the details were too clear. A large lizard nearly two feet long flopped down from the top of a low tree and splashed water. It made an unmistakable sound as it ran across the surface. Turning my head somewhat I

noted the strange American and a Manobo, who was squatting in the stern, guiding the canoe. I tried to speak but could get out little sound. I finally attracted the attention of the stranger and he told me we were on our way to find help. He talked for sometime but again I slipped into unconsciousness. I next awakened when the man in front tried, unsuccessfully, to keep the boat from hitting a submerged stump and tree. Much to my detriment, I was thrown into the water and floated some distance downstream while my companion caught the boat as it swung around.

We finally reached Butuan, where I was taken to the Visayan doctor and put to bed. It seems I had a fever, commonly called dengue, that is insect-borne. It seizes its victim with startling rapidity, bringing intense pain in joints and muscles, so that it is sometimes called breakbone fever. The victim passes from states of consciousness to unconsciousness when the fever is high. Within three days the fever broke and my mind seemed clear. The pain was less severe and I was hungry. Recovery of strength was slow but after two weeks I was able to walk about, and before the end of the month I started upriver to do battle once again with Mandalingan.

This journey was made in the launch, with the governor accompanying me. The glare of the sun on the water tired my eyes. To add to the general discomfort, the launch was having difficulty getting over sand bars in the river, and, at one point, the governor suggested that some of us get into the shallow water to lighten the craft so it could get over a bar. Still weak, I slid over the deck into the water, but it was not so shallow and the current picked me up and carried me back downstream. Unable to swim against the current, I floated with it like a dry chip for about forty yards, until the launch could turn around and come after me. At another point, on the second try, the launch passed through the shallow water and was on its way.

A young teacher, Ciriaco Moreno, had been sent from Butuan to look after the school while I was away. At first he had been very reluctant to come upriver, fearing these wild people. But he had done a good job holding everything together. He had tried to plow and had given English lessons to the boys. We continued the plowing and had the boys smooth the surface with our old homemade harrow; we started at once to replant the corn.

The boys seemed glad to see me and their first question was about the corn. "Did we winning the prized?" Basilio asked. But I had to say I did not know. And Tiburcio insisted, "Mandalingan no killing you yet." Pedrinka had assumed some control while I was ill and had ordered the boys to do the chores such as taking care of the carabao and preparing the food. They had even played their daily baseball game.

10. BIG BLUE RIBBON

The corn was growing and the bananas, planted on my arrival, were beginning to bear fruit. Our garden was excellent, providing a variety of yams, eggplants, gabi, and a dozen other vegetables including onion and manioc, the tapioca plant. The eggplant was nearly as high as the boys' heads. There was now no chance of another food shortage.

Pedrinka came in one morning as I was eating my breakfast. "Launch come today. Meby we have letter for the prize," he said.

"How do you know, Pedrinka?"

"Yesterday the launch sleep in Talocogon, today come to Bunawan I think."

And in the late afternoon the launch came. The whole school was waiting, since I had permitted everyone to cross the river to be at the dock. The boys came back with my mail, the first to arrive since my return. There was no letter about the corn. I was disappointed, but the boys were more than that; some were almost to the point of tears, and I heard some very uncomplimentary remarks in Manobo, as they called down curses of *Lintic yawa*.

Antonio, the houseboy, suddenly seemed to remember something and went into the house. He returned carrying a small package of mail that had come while I was in Bunawan. The mail was several weeks old and in the lot was one letter, a fat one, from the office of the Director of Agriculture. The boys were breathless as I tore it open and read:

I have the honor to inform you that the corn submitted to the Bureau has taken first prize in the Bureau of Education exhibits and in the exhibits of the National Carnival. Please accept our congratulations. The blue ribbon is enclosed.

Submitted through the Superintendent of Schools.

If before we had been depressed and disappointed and angry, these moods evaporated like mist before a tropic sun. We could not have been happier, or more vociferous in our happiness. A holiday was declared, and everyone could do as he pleased.

Of course, I was delighted to have the time to try to pick up my old trail in the forest and to recover some of the finds of that ill-fated journey I had undertaken several weeks before. Three boys asked to come with me. We were a few hundred yards into the forest when we inadvertently disturbed a group of sleeping wild boar. Each of us ran for a tree while the pigs vented their anger by stamping their feet with their neck roaches elevated, and then disappeared deeper into the forest.

Four men can turn over larger rotting logs than one man, and there was more to be found under the bigger ones. Some of the species I had taken on my previous journey were again in the col-

lecting sack. Gorio had found a tiny species of flying lizard quite unlike other species of these strange dragons taken earlier. This one had round black spots with a cream center on each side of the head and its colors were dull. We had seen them before, but they had always kept to the high trees. The boys continued to climb into the trees, cutting plants and letting them fall to the ground. More lizards and one snake. As we rounded a bend in the path, a handsome *haguason*, his head erect and about ten inches above the ground, the neck flattened and spread, threatened our advance. I yelled for the boys to watch out for their eyes; mine, of course, were protected by my glasses. On our approach the snake opened its mouth and sent two tiny streams of venom in our direction. The venom, if it falls on the skin of the hands or face, is no more dangerous than water; in the eye, however, it can cause blindness. It was then a simple task to throw a collecting noose over the snake's head and to transfer our catch to a stout bag that Tiburcio carried on the end of a short pole.

We finally devised a scheme of cutting the plant masses and letting them fall into quiet pools or in a rivulet; as the water soaked into them, out would come a variety of insects, worms, occasionally lizards, snakes, and even frogs. We were really having a field day. One of the boys said that a curious skeleton-like small tree had much water; it also had a few tufts of leaves at the ends of its branches. It belonged to the screw-pine family. We cut it down, expecting to find tree frogs, but instead netted twelve specimens of a curious narrow-mouthed toad (*Kaloula conjuncta*), of a kind one would never have expected to find in a tree, since most of the species of the genus burrow in the ground.

Sound came booming through the forest on the native telegraph. Tiburcio said, "War party come with spears. Also launch come up river." And we were being called back to the school.

Gorio said, "Meby, we have *pangayao*." But I suspected that the "war party" consisted of the *dato* from the Mandaya village, and the launch meant that the governor was coming from Butuan on an inspection trip. We returned to the school as rapidly as possible and arrived before either of the visitors. When the governor disembarked, we told him the *dato* was also expected.

The war party arrived, but, despite the fact that all were carrying crises and spears and were decked in their finery, they were not on the warpath. The meeting between the governor and the *dato* was held at the school, conducted through interpreters. The governor explained that in other places tribes were building their villages along the rivers, and that the government wanted to make the *datos* the presidentes of the villages and would also build a *presidentia* or a place for the village business. The *dato* was asked if he would consent to bring his people out of the forest to resettle by the river.

Then there was the matter of headhunting. The *dato* said that the only heads they had taken were from neighboring groups that had killed some of his people. If his neighbors did not molest his village, he would not molest theirs.

After the conference was over the schoolboys played a game of baseball. The son who had accompanied the war party, decked out in his feathered hat, jewelry, bright-colored jacket and trousers, watched the boys in their khaki uniforms with much interest, and perhaps more than a little envy. The *dato* talked to the boys. They looked well fed and happy, and said the school was a good place to be. I asked the *dato* to leave his son with us and assured him that if the boy grew lonesome, he could return home. The boy remained, and I suggested to the others that they make an effort to keep him from becoming too homesick.

The governor left in the afternoon and we went about our regular business. The captain of the constabulary and his personal servant, a Visayan boy from Cebu, remained in Bunawan. I had told the captain about our difficulties with the wild boar and the deer. That evening after the captain had retired, his servant, wanting to take a prize, "borrowed" his superior's rifle and with a Manobo boy from the village came over to the forest bordering the school property. The Manobo boy was left behind near the house while the boy with the gun went along the fence, hoping to see game in the brilliant moonlight. After some little time had elapsed, he returned quietly. The Manobo boy, who had moved on to the eggplant patch, stood up at his approach and the hunter, mistaking him for a deer, shot him in the head; he was killed instantly.

When the hunter realized what had happened he became panic-stricken. He ran to my house and left the gun, telling me that he had killed a Manobo, then got into his dugout canoe and crossed the river. I had heard the shot as I sat under a great mosquito net rereading one of my few books, and had been concerned about its source. Now, I was even more troubled, for I knew there would be difficulties both for the hunter and for the constabulary captain. I roused the boys and we retrieved the body of the youth, carrying it to my house on a blanket fastened to two bamboo poles. As soon as our dugout could be readied, we took him across the river to his parents, Manobo folk who had recently come from the forest to construct a new house in Bunawan.

Soon a party of Manobos and the boys who had served as pallbearers came back across the river. The leader of the Manobos, brandishing his spear, announced to my utter surprise that they had come to kill me. Definitely afraid, I went into my house, closed the door, and talked to them through the open window. The boys, who were still standing about, arranged themselves on the steps to prevent the hostile visitors from entering and tried to persuade them

that I had not killed the boy, that the gun was the captain's and not the maestro's. But the look on the father's face and his threatening manner with the spear showed that he did not believe them, for there, still standing at my door where the hunter had left it, was the gun that had killed his son.

I tried to talk with them, but my faulty Manobo only made for confusion. I told one of the boys to go across the river and tell the constabulary what had happened and to alert the captain that if they did not kill me they would probably kill him. Finally, Pedrinka took the highest step in front of my door, picked up the gun, and with the natural oratory of a grownup warrior, began shouting his harangue in Manobo.

"This gun is of the Constabulary. Maestro no gun. Maestro needs no gun to kill, he much magic. This gun Captain gun. Captain's servant seeks to kill wild-boar that eats from corn field, but bullet finds head of your son, and son's head destroyed. Perhaps you make crime to Mandalingan and Mandalingan turns bullet from his wild boar to your son, or perhaps captain does wrong to Mandalingan. You must talk to captain's servant. Captain's gun killed your son. I finish."

Finally the father was convinced that I had nothing to do with the killing, and the party returned to the village, saying they would kill the captain. When they reached the presidencia where the captain had lodged, he had already taken refuge in one of the rooms in the *carcel* (jail) and had stationed three armed constabulary soldiers to guard him. He knew Manobo law—"a life for a life"—and realized it was not only his servant's life that would be demanded. He sent his sergeant off by boat with the hope of overtaking the governor at Talacogon, where he was spending the night. Fortunately, the aide reached Talacogon the next day in time to bring the governor back to Bunawan.

You may think the captain behaved in a cowardly manner, but his actions were motivated by reasonable tact in dealing with a delicate situation in which the Manobos might all decide to return to the forest. The governor called the parties together and the matter was placed before him. When he had heard all the evidence, the governor felt that although the servant had "borrowed" the gun without the knowledge of the captain, the captain was guilty of negligence and that he, as well as his servant, must in a measure share the guilt. The dead boy's father agreed to this finding. Then the governor ordered that the captain give the injured father, as restitution, one carabao, six spears, two *agongs*, and one bolt of cloth, or something of equivalent value. The whole amounted to about one hundred pesos, or half as many dollars.

The second year of my sojourn in Bunawan was drawing to a close, and I began to take stock of our accomplishments at the

school. We had thirty-one boys enrolled from all over the Manobo country; we had nearly four hectares (approximately 10 acres) under cultivation, and were raising practically all the food consumed at the school, except for rice and fish. Corn had replaced rice in the diet to a considerable extent. The baseball diamond showed much use. Cirioco, the teacher sent from the Visayan Islands when I was ill, was retained to teach English, simple arithmetic, and writing; they even learned songs. But their voices, uncertain at best at this age, gave promise of becoming only the curious high falsettos in which the men always sang their native songs. Cirioco also taught the boys to make door mats from the fibers in coconut husks, and these could be sold when sent to Manila. The fear of danger from Mandalingan passed. After he had inspected it, the governor pronounced the place in excellent condition and complimented me on the result of my efforts.

I was aware of the outside world only through newspapers from the United States, which told of the newly-elected president, the Democrat named Woodrow Wilson, of the unrest in Europe, and of the Japanese preparation for war. There were Japanese in the Mindanao territory whose presence was unexplained and I occasionally saw them passing up and down the river. I had written to the governor of their activity, as it was obviously a "spying out of the land," and their reports were subsequently intercepted by Manila.

Usually we were engrossed in less serious matters, such as the new diversion we discovered one Sunday. Some of the boys knew where gold was to be found in the sands of a small tributary of the Bunawan River. Sometimes we would dig in the sand and wash it, to find the gold particles. But panning for small quantities of gold was a far less interesting hobby than collecting the strange plants and animals of the jungle country.

II. FIRED FOR INEFFICIENCY

Word came to us from Butuan, the provincial capital, that the Secretary of the Interior from Manila was coming to Mindanao on an inspection tour. He would visit the wild tribes and would come upriver to Bunawan on Thursday with his retinue.

All wild peoples of the Philippines were under the control of this secretary, as were all governors and lesser governmental officials, of these unorganized provinces. He was rightly feared by everyone. It was only Tuesday and already the village people, urged by the captain of the constabulary who had recently come upriver, were building a beautiful arch of bamboo and decorating it with the foliage of the forest, including orchids brought from the jungle. This I thought might be expected from the village, but I saw no reason for our American school to make what was, in my opinion, a stupid display.

The "Great White Father" arrived to make his inspection, and it was thorough. We were well prepared, however; the boys had laundered their clothing, policed their dormitory, cleared the path bordering the river, and patched the fences. They had spent the morning of the "great day" in their work clothes hoeing the corn, although there were no weeds and the cultivation was not badly needed. But there was no welcome arch! Thus the secretary found that the corn was not properly planted, there were stumps in the fields, the boys were not given proper rice rations, and they were forced to work too much. Some efficient person would be sent to relieve me, since I was not fit to manage the place.

Such a fate! I grant I had done many things that perhaps should have warranted my dismissal: I had practically forced a large number of the students into the school against their will; I had deceived them greatly and lied about my abilities as a magician; I had defied their god and destroyed his sacred property—all good crimes for which I could have been "fired." But the charge was "inefficiency"; the cause was actually "no arch of welcome for the 'Great White Father.'"

I prepared at once to pack my belongings to make the return journey downriver with the inspection party. But my preparations were needless. The secretary found that it was quite impossible for me to travel with that party; I did not have to seek the reason. I had the boys help me build a raft of bamboo, instead. With the aid of two Manobos we cut the bamboo and dragged it to the river with old Slowpoke; the carabao at last had come to tolerate me without showing fright. Perhaps she remembered that I took care of her wounds after her encounter with the crocodile.

When the raft was finished, I found I was in no hurry to leave. I decided to spend two or three days making a final survey, to see if there were species of reptiles that were lacking in the collection—some frog or lizard that was waiting to become immortal by having me preserve it for posterity and christen it with some lordly Latin name. I profited much by this short vacation. The boys and I went back into the tabu forest, following trails that we had cut previously but that were now almost completely overgrown. We found species not seen before and another curious earth snake (*Typhlops*). We uncovered a small slender coral snake (*Doliophis bilineatus*), that when disturbed would elevate its tail, turned under-side up, coiled like a watchspring. It was deep crimson in color. Its head would be conveniently hidden under a bit of trash and if we touched the creature it would throw its body off the ground again and again aimlessly. The snake was deadly but it made no attempt to bite us or even to strike.

I kept hoping that we might cross my old trail made during the ill-fated expedition when I came down with dengue fever; I wanted

to find the sack that would now contain only skeletons. But this did not happen. We did find, however, two specimens of another known species of snake in a pile of recently fallen orchid plants. There we also obtained eggs of a tree lizard (*Calotes*), one with a large angular head, a compressed body, and a long tail. The curious thing about the eggs was that they were spindle-shaped with elongate, blunt projections on each end.

Returning from our last journey in the forest, we passed by the palace of Mandalangan. To show no hard feelings for the old god I tossed him a small handful of cigarettes which fell on the earth among the other offerings, a flat shell with fresh oleander blossoms and the partial skeleton and feathers of a white chicken. Mandalangan favored white chickens. However, whether he appreciated my cigarettes, made of raw tobacco of warrior strength and costing seven cents per package of twenty, I never learned.

We came back to the mahogany house, and as I looked up into the tree that stood beside it, I saw on a low branch a superbly colored smooth-sided skink, a lizard I had never seen before. It was my last prize from Bunawan. It had probably watched me from the day of my arrival, but in two years I had never seen my neighbor. It was a species, however, that already had been discovered and named.

The python we had caught on the first journey upriver had taken up residence in a storehouse and stood guard against the forest rats who would eat the food. We usually could find him, but the two years had done nothing to improve his disposition and our relationship had been one of mere toleration. Since he was getting careless and rats were getting to the stored grain, I decided to fire him from his job, for reasons of inefficiency, and take him with me to Manila.

I had not had any particular regrets about leaving until it was time to say goodbye to the boys. Then I realized how much there was between us. As they offered small, pitiable gifts to me, some boys had to forbear saying goodbye for fear their tears would be seen by the others. So ended this first important chapter of my life, and my career as a farmer and baseball coach.

The journey downriver was uneventful but full of memories. To avoid having to camp at dark, I fixed it so I could sleep on the raft; and with one man to stand guard and keep the raft on its course, and another to relieve him, we had to stop only to cook rice. We saw a few faces peering at us from the riverbank; once we found two girls bathing behind their barrier of bamboo poles. We passed and recognized old camping places used on my first journey.

To my great surprise, when we arrived in Butuan, the good ship *Negros* was in the river ready to take me to Manila. Another special boat already had taken the secretary and his party. The governor was most kind; he transferred my baggage directly to the boat, and

then invited me to have dinner with him and other Americans in the town. It was a farewell party. At the beginning of the dinner he gave me news that was most heartening. The Secretary of the Interior, the "Great White Father" of the wild people, had been fired by the new President Wilson. I never learned the cause but I suspect it may have been for "over-efficiency." It was the one time in my life, thanks to President Wilson, that I considered the possibility of becoming a Democrat.

The dinner was long and drawn out, accompanied by stories from the various guests of their past years in the Philippines, some funny, some remarkable, some sad. I was a listener. It was late when I went on board ship, with a promise of a headache for the morrow. We were to leave at high tide in the morning to get over the bar at the mouth of the river. About daybreak I was awakened by a terrific jolt that rattled dishes in the galley and caused the ship to pitch and toss. Another earthquake—perhaps Mandalingan's way of saying goodbye and thanks for the cigarettes.

When I awakened again I went up on deck to watch the disappearing coastline and the distant mountains of the wonderful island of magic, Mindanao. Mindanao; the name even today brings back a thrill, an exultation, and a host of nostalgic memories of a time when I was learning things from the "yellow and the brown." Things that would help with the whites.

I had much time to think over the past two years. I sat on deck and gazed into the placid, oily water. What had become of the little boy who had broken his arm in the fall that left him a cripple? Where was the young son of Taoidi who had sworn to kill the Americans who had imprisoned his father? Where was my American friend who had carried me downriver when I was ill? What was hidden in the mountains and jungles beyond the ranges? Would someone find the source of the gold that we panned in the river? Would I go back and retrace those footsteps?

12. MY LIFE ON NEGROS ISLAND

After my sudden departure from the land of the Manobo, smeared with the anathema of inefficiency, I started for Manila hoping to obtain some other civil service appointment. I did not feel sorry for myself, nor was I resentful. A change might mean more and different adventures. In conversations with the provincial governor of Butuan, I had learned that the "Great White Father" of the wild people, the erstwhile American Secretary of Interior, was not held in high personal esteem, even by governors. The governor prepared, without request on my part, letters of commendation stating that I "had exceeded his hopes." Also, Mr. Scott, head of schools, expressed satisfaction for my accomplishment and provided a letter of recommendation.

I arrived in Manila, found lodging, had a two-dollar dinner at the Manila Hotel with apple pie a la mode for dessert, and went to a cinema, all in my first day. I definitely was back in close touch with civilization. I also bought a newspaper, the *Cable News American*, with news only twenty-four hours old. Down in Bunawan my news had been stale, one to two months old, and even that was only available about once a month. Before going to Mindanao I had thought bread and butter, together with apple pie a la mode, were necessities of life. But one learns. These things are luxuries, as are the daily news of the world, telephones, and trains.

I presented myself, and my credentials, to the committee dealing with schools. Then, awaiting the completion of my financial affairs, I explored Manila. I examined the old walls about the ancient part of the city, built in the past to keep away attacks from dreaded Moros, the Mohammedan pirates from the south—walls where later I was to have a splendid aquarium. The old moat surrounding the walls had been drained to remove the hazard of the malaria-bearing mosquitoes. I visited the College of Santo Tomas, a school that was old before the first college had been established in the United States. At the Bureau of Science, I became acquainted with certain members of the staff. I looked through their collection of reptiles and discovered that many of the species I had collected in Mindanao were not in their museum.

I was later assigned as a supervisor to a district in Negros Occidental, a province on the western side of the Island of Negros, one of the large islands in the Visayan group. My headquarters was to be in the city of Hinigaran, a community with an estimated population of 37,000. One glorious item was that my salary was to be raised \$200.

Since the present incumbent on Negros was not planning to leave until the fall, I decided to use the time before taking up this position by returning to the States and enrolling in summer school at the University of Kansas. I departed by boat via the Pacific route and eventually arrived in Lawrence in time for the summer session. I completed the school work and received the M.S. degree.

Arriving in Manila, I found I had about ten days before I must leave for Negros, so I decided to take a collecting trip. Across Manila Bay one can see on the Bataan Peninsula the mountain peak of Marivales, and the Zambales Mountains running north and south. South of the city were still other mountains, all offering a challenge to come and explore. There must be animals and plants, strange and new, that were waiting to be found.

A railway running south from Manila passed along the shore of Laguna de Bay, a large fresh-water lake drained by the Pasig River, to the small city of Los Baños. I planned to go to Los Baños and from that point climb Mt. Makiling, an old volcano that rose up from the shore of the lake. Moreover, Los Baños was the location of

a government school of forestry where I could obtain lodging and perhaps find a companion or guide for a journey to the peak. I got together my collecting gear and started south, traveling slowly for hours in unbelievably hot railway cars. At every stop the native food sellers passed up and down the station platform offering, through the car windows, dingy-looking cakes, sorry shrimp, various fruits, sprouted-bean pie, and supposedly delectable *baluts*—those boiled, incubated eggs containing large embryos of chickens or ducks. Frankly, I prefer chickens somewhat older and duck only rarely.

At Los Baños, I put up at the house of a government official where certain teachers of the forestry school boarded. I met the director of the forestry school, Dr. Baker, an entomologist of note. His collection of insects was enormous. He was accustomed to sending groups of specimens to specialists over the world, retaining the types. At his death the collection was given to the U.S. National Museum; it was reputed to contain some three million insects, presumably all studied, including a remarkable number of type-specimens.

On learning of my interest in reptiles, one of the professors told us of a happening in his class some three months before. His students were sitting on stools alongside a laboratory table, which had a separate compartment below each place. As he passed behind one of the girls who was carelessly swinging her sandaled foot back and forth, he happened to glance under the table. There, coiled on the floor, was a king cobra, its head reared up and swaying back and forth with the slow movement of the girl's leg. His shock on seeing the snake was great, but he acted with speed. He yelled to the class, "Don't anyone move!" Then, grabbing the girl, he dragged her from the stool and pushed her out into the room, to the utter astonishment of the class. The snake was startled and issued forth from under the table, starting directly toward the professor, who struck it on the neck with a yardstick he had snatched up as soon as the girl was out of his grasp. The reared head, standing nearly three feet high, was knocked to the floor. A door nearby, through which the snake had entered, offered an escape route and it slithered from the room. The snake was pursued and a few more blows killed it. It was later preserved in a jar of alcohol. The snake, which I measured, was more than seven feet long, or less than half-grown.

I had been provided with a husky forestry student to accompany me up the mountain. The morning after my arrival we were on our way to the summit of Mt. Makiling, taking only our food, collecting sacks, and two gasoline lanterns. At first we followed the well-defined forest paths that had been made on the lower parts of the mountain, largely by forestry students. We were continually stopping to explore a fallen log or to turn over rocks in search of burrowing snakes and lizards. My Filipino companion was active

and he would cut down ferns and orchids from the trees, then I would chop them to pieces with my bolo. Each of us acquired a good strong cane to be used in case we should find a cobra or other snake that might demand severe treatment.

We were on the whole very successful. Along the small rivulets that we crossed, we found brook frogs that took to the water as we approached and hid in the soft bottoms of clear pools. However, the milky sediment that was churned up gave away their hiding places; we waded into the water and, ducking under the surface, succeeded in finding several.

Later, in moving a bit of drift trash beside a stream we found a small snake that I suspected was an unknown species. It was gray-blue in color with bands of cream. This snake needed extraordinary treatment, so I put it in a special sack and saw to it that this sack was handled with extreme care.

We built a fire and cooked our rice and made coffee, using a tin can to boil water from the mountain stream and a brand of instant coffee. We rested for a time after lunch and then resumed our journey. The paths were less distinct but we knew our general directions. It was getting cooler as we went up. We routed out several small frogs from some water plants and obtained certain lizards that scuttled through the dead leaves on the ground. A rumble of thunder and an overcast sky told us to prepare a shelter soon or take a drenching. We cut some small poles and made a skeleton shelter, then spread leaves cut from giant caladiums over the frame. When the first drops fell we were completely sheltered, although we were already somewhat wet from perspiration and wading, but sat while the rain poured down.

It was afternoon when the downpour ended and we continued on our way, for we planned to spend the night on the summit. The sky was still overcast and in the forest the light was dim. I saw Arturo scrape a leech from his hand with his bolo, and soon realized that I had some of the same visitors. We presumed that they were in a belt in this area below the peak and that soon we would pass this army of bloodsuckers by going higher. As protection I rewrapped my puttees tightly around my boot tops and legs.

Later it became necessary to light our lantern after the sun set behind the mask of cloud, and the thin thread of a path we had been following seemed to be lost. Arturo felt certain he could find the path but we had to get around some steep points. Fortunately at this elevation the jungle was not dense, and we were able to go on. After half an hour we stopped to listen to frog calls and pick off any recently acquired leeches and in the near silence I heard a strange, quite inexplicable noise. It sounded exactly like a very thick liquid boiling on the kitchen stove, complete with the noise of bubbles popping as they reached the surface. But this was no small pot of

soup; it must be an immense cauldron. I asked Arturo what it might be but he could offer no explanation. Surely no group of breeding frogs could make such a noise. We moved forward cautiously since the undergrowth had become denser, but soon the brush gave way to open blackness. We found our boiling pot. We shone our lantern into the blackness. Six feet below our level was a great pit of boiling mud perhaps a hundred yards in diameter; puffs of steam issued from the small mounds that rose up, exploded with a plop, then sank back to a troubled surface. We had stumbled upon a small mud-volcano that we did not know was on the mountain. At this point, we knew we were far from our path and the only certain way for us to go was up.

We started to climb and leeches became less numerous. Finally I decided that, although we had not reached the summit, we would stop for the night. We chose a place that was rather flat. First we picked off all the leeches we could find and then prepared for the night. We built a fire, cooked our rice, and had a belated supper. I cut a series of slender poles about seven feet long, tied them together to make a platform about three feet wide, and braced this with crosspieces. I suspended the platform horizontally from the low branch of a tree a few feet above the ground. This was to be my bed. I urged Arturo to make a similar one, but he laughed at the idea, and prepared to sleep on the ground. He scattered ashes from the fire on the ground saying that they would drive away the leeches. Perhaps he was right but I still thought he would be wise to follow my example. He was asleep almost at once, however. I loosened my clothing and found numerous leeches scattered over my body. I hit upon the scheme of slowly bringing a lighted cigarette close to the body of the leech as it was gorging itself with blood. The heat caused it to withdraw its hooks and drop off. Finally, having de-leeched myself and wondering if the leeches would steal all our blood, I fell asleep. We awakened about daybreak. I had passed a reasonably comfortable night, but my companion had not fared so well, for leeches had utilized certain surfaces as well as certain entrances to his body, including his nostrils, which caused him considerable discomfort and pain.

I congratulated myself on escaping all that. But as I made my toilet and started to prepare breakfast, a leech got in my eye under the lid. I did not dare pull the leech loose, for it would have caused eye damage. I forebore and endured the creature for about half an hour when, bloodgorged, it loosened itself and pushed out of my eye. It was not painful but caused much discomfort.

We started back down the mountain after having only moderate success collecting near the top. Most of the specimens were of well-known species. We found a few more specimens on the lower part of the mountain and finally reached the forestry school late in the

evening. Here I was able to remove from my clothing and from my body about 120 leeches. These I placed in a small bottle of alcohol and kept as documentation of a seemingly improbable story. But my fine snake in the special sack was now gone; seemingly it was more sharp-sighted than I and had found an escape from the sack.

On the weekend two of the younger American teachers accompanied me during short collecting jaunts in the vicinity of the school. Both were good helpers. Visiting the nearby shores of Laguna de Bay we found many water serpents lying on the bottom in shallow water, and a series of a dozen or more was taken. These snakes belonged to a nonpoisonous genus and they could be picked up without difficulty since they made no attempt to bite. They had a curious character—it appeared that the internal organs were not fixed in place, and when the snake was held head up the viscera seemed to fall back, filling the lower part of the body. The scales of these snakes were sculptured in a most intricate fashion.

It was now time to return to Manila. I was continually amused to think that after being fired for "inefficiency," I had obtained my new assignment with practically no difficulty at all, thanks in large part to my letters of recommendation. And on the same day I received the assignment, newspapers from the States told in more detail how the "Secretary of Interior Dean Worcester had been fired by President Wilson." I am aware I should have felt some pity for the poor "White Father" but I can honestly state the contrary was true. I fear too that most of the contemporary government employees likewise felt no sympathy. Some may have recalled the quotation, "Lo! How the mighty are fallen."

13. CONQUEST OF CANLAON

I journeyed to Negros on an interisland boat, and on arrival my first impression was not a bad one. I learned that the population of Hinigaran consisted of friendly, civilized Filipinos, who spoke both Spanish and Visayan. There was, of course, a sprinkling of Chinese, as well as one European, a Catholic priest of Irish birth, and a few second- or third-generation Spaniards.

Since at Hinigaran there was no hotel, it was necessary to rent a house, find servants, hire or buy a horse, and set up as a citizen of the town. I visited the priest and he helped me find a large, rambling house near the beach that was peopled by a variety of shrews, rodents, bats, and lizards, not to speak of roaches, mosquitoes, etc., etc. No longer had I a house built of Philippine mahogany or a family of second-generation head-nappers to instruct.

Priest Rogan, "Padre," as he was addressed, became a worthy friend. He was a great help in finding needed shelter and equipment. He found a man-of-all-work to serve as rice-boiler, market-man, dishwasher, and groom for my soon-to-be-acquired steed that

was destined to transport me to the schools in the surrounding towns and barrios. The name of this "boy" of uncertain age was Juan, and although it is possible he had another name, at the moment I cannot remember if I ever heard it. His language was a mestizo patois of his own, which mixed Tagalog and Visayan words with Spanish and, frequently, English. For example, my horse was "muy bad caballo, poco ciego, and no see" (very bad horse, little blind, cannot see well).

My work took me to the town of Isabella and its nearby barrios and to the barrios of Hinigaran. I found the young Filipino teachers doing well and the elementary classes thriving. Almost to an individual the teachers, both men and women, were energetic and willing workers.

On Sunday evenings, Juan, in the guise of chef, prepared food and my friend the padre was my dinner guest. I found the good father a delightful person. I maintained a supply of sweet malaga wine, which pleased him, and toward the end of an evening, melowered, he would relate humorous stories. Although repetition was rampant, I was always able to laugh because they were recounted in an inimitable Irish brogue.

Near the center of the island arose a great volcano known as Canlaon. From a little above sea level it soared to a splendid height of nearly 8,000 feet. Its slopes were covered almost to the summit with a magnificent carpet of forest, while its crater, usually quiet and placid, would occasionally belch forth some gas and throw a few stones to warn the world that it was not dead but merely sleeping. From the first moment that I saw this mountain I wanted to visit it. I set about getting a party together.

A young American Lieutenant of Constabulary named Ralph Lincoln Christian was stationed in Isabella, and I persuaded him to agree to accompany me. At La Carlota, farther north and much closer to the volcano, was another young American, Homer McNamara, assigned to the government agricultural station there. The three of us decided to climb the volcano, but for several weeks our duties forbade such a journey. When a short vacation did come, Christian was unable to go; however, Homer McNamara and I decided to make a preliminary journey to ascertain something of the difficulties and to make some scientific collections on the lower part of the mountain. We chose a weekend for the experimental trip.

At the agricultural experimental station we obtained two horses and started early one morning (actually Christmas Day) along a trail that led into the forest through the fields of the agricultural station. It looked as if we had chosen a perfect day, and having started early enough, we were in the cool forest before the sun became hot.

We crossed a mountain gorge, fording the stream without diffi-

culty since the water was scarcely knee-deep for the horses. We then went on up through reasonably clear forest. The path was dim but easily followed. I should mention that Homer was riding a potential stallion known as an "original." Its testes had failed to descend. In consequence, we rode apart from each other since my horse was a mare.

By eleven o'clock we had reached a spot which I thought might offer good collecting. I could hear water and knew there was a stream nearby. After removing their saddles, we tethered the horses so they could graze and, having emptied our canteens, followed the sound of the water. Less than a five-minute walk brought us to the water, a magnificent spring that gushed out from among rocks and formed a swiftly-running, shallow stream six or eight feet wide. Here we filled the canteens.

Then we began searching for specimens. We heard a few frog voices and found several species of brook frogs in the immediate vicinity. Growing on the slopes nearby was a thick patch of wild banana plants, which produce a fruit that looks like a small banana but is so full of seeds that there is little edible pulp. Knowing that the leaf axils of bananas catch and hold water, I thought this would be a good place to look for frogs, so I began cutting down stalks and, to be sure, a small frog was in almost every plant we cut down; we obtained a good series of them. Instead of conforming to a single color pattern, each example was usually colored and marked differently from every other. The species was later named *Philautus hazeli*.

Under a log I found a new species of blind snake that was shiny greenish-black on the back and sides, but pinkish-yellow on the underside. This was later christened *Typhlops canlaoensis*. Along the stream we found a water snake that was quite new to me (*Natrix dendrophiops negrosensis*), reddish-brown above with a series of dark bars on the body. Then we obtained several specimens of a small snake with four lines on the body, and still another small, burrowing snake, iridescent bluish-brown (*Cyclocorus lineatus*). Examination of the bird's-nest ferns that grew on the tree branches, often spreading their fronds ten feet, yielded two species of lizards, a tiny gekko (*Lepidodactylus christiani*), and a tiny skink (*Sphenomorphus steerei*).

We suddenly realized that we had not eaten lunch, which had been left where we tethered the horses. It was almost one o'clock and breakfast had been at four—no wonder we were nearly famished. We ate rapidly, as it had begun to cloud up, and were soon back at our happy task.

The rain was coming closer. We made a hasty shelter out of the leaves of the giant caladium and the rain came down torrentially. We remained dry, but regretted the loss of precious time.

The rain, after the first downpour, stopped for a time allowing us to collect. Later it continued somewhat more gently. As it was growing late, we left our shelter, got our horses, and started back down the mountain, shivering a bit from the cold. It was totally dark and still raining when we reached the gorge we had crossed early in the morning and we found it now full of swift water. We debated whether we should try to cross; a cold, wet, and most uncomfortable night was the alternative. We decided to attempt a crossing. I went first; my horse was picked up by the current and thrown against a large boulder. The roar of the water drowned out our voices, and, thinking that I had gotten across, Homer followed. As his horse came plunging, it reared as it approached the mare and its hooves struck me in the back and knocked me into the torrent, with my sacks and cans containing the precious collection. My horse, now free of me, managed to make the opposite bank, and while I was between the boulders I too managed to make the opposite bank. I emerged from the water perhaps a hundred feet farther downstream, but without a single specimen of serpent, lizard, or frog to show for the day's journey. The sacks containing two cans had been tucked in my belt but the water had pulled them away. Homer's horse had managed to plunge and swim through without serious mishap.

I recovered my horse and we reached the agricultural station much later, very tired, very cold, very wet, and very hungry. One might well imagine that the old giant in the volcano—like my old enemy Mandalingan—resented our coming and trying to take his animals from the mountain.

A month later we planned another ascent, and this time Lieutenant Ralph Christian and John Deren, the fifteen-year-old son of a provincial official of Bacolod, were to accompany us. We were to make the ascent on foot, certain that we would be able to travel as fast as the horses. Each man had his pack containing rice and other food. I had my collecting outfit, including a gasoline lantern for night forays, since the purpose of our journey was to rediscover the species collected and lost on the previous trip. We started early after a hearty breakfast and were soon retracing our previous trail, moving single file up the mountain.

We rested from time to time, for none of the others were as experienced in mountain climbing as I. During these rest periods I searched for specimens. We reached the great spring before noon and remained in the area for the rest of the day, collecting with considerable success. We decided to camp here for the night, too. Remembering the rain of the last journey, we set about making a shelter out of bamboo and palm leaves. When it was nearly finished Ralph, who was not an expert with his bolo, struck a bamboo

trunk a glancing blow, throwing the blade against his arm, cutting both veins and arteries.

As quickly as possible, I prepared a tourniquet from a long sack and twisted it above the elbow so the loss of blood was largely stopped. But we had to get him back to the station and to a hospital. Homer and I started back down the mountain with Ralph, leaving John with our equipment. It was necessary to loosen the tourniquet frequently and as a consequence more blood was lost. For about two hours Ralph had been walking under his own power but, weakened by loss of blood, he then nearly collapsed.

We made a swinging chair suspended between poles on our shoulders and carried him slowly over the rough territory, although at times he would walk a little to give us a rest. A six-hour walk brought us back to the agricultural station where the superintendent sent the lieutenant by auto directly to the hospital at the provincial capital, accompanied by one of the station employees.

After some food and coffee, we started back up the mountain, despite our fatigue. We reached camp about daybreak where we found John safe and dry. We ate again, breakfast, and slept for three hours.

Leaving part of our food supplies well hidden, we continued up the mountain. We collected in a rather leisurely, but successful, manner all morning, and after lunch took a much-needed siesta. Nightfall found us still nearly a thousand feet from the summit. We stopped, built a fire, got supper, and collected leaves and mosses for a comfortable bed. We were at an elevation where there were few or no mosquitoes, and it was cold.

I preserved most of my specimens in jars of alcohol and placed the jars in a large knothole in a resinous tree near the campfire. I wanted nothing to happen to these specimens, which duplicated most of those lost on our first journey to the mountain.

We were extremely tired and soon fell asleep, after throwing much wood on the fire. Sometime toward morning I was awakened by what seemed to have been a pistol shot. I was scarcely awake when I heard another! Were we being attacked? I realized suddenly that the tree where I had hidden my specimens had caught on fire and, being very resinous, was burning rapidly. The jars of alcohol, after boiling my specimens, had exploded and scattered pieces to the wind. The others awoke hastily and moved the beds and equipment. Within twenty-five minutes the tree came crashing down, scattering branches over the place where we had been sleeping. No one was hurt but the collection of the past two days again had been snatched from our hands.

There was no more sleep for us, so we decided to cook breakfast, but the tree had fallen on our rice and tinned food. Only a single

can of beans could be reached. We kept as close to the fire as possible, for a cold drizzly rain had begun at daybreak.

Since we had come to visit the volcano, we started on up to the summit carrying with us our single can of beans. The exercise kept us reasonably warm but at the summit it grew colder. Finally we stood on the rim of a great crater nearly a half-mile across. From one side there arose a new crater reaching about three hundred feet higher. We descended into the old crater and found that it grew colder closer to the bottom where, some three hundred feet below the rim, pools of water were covered with ice. I tried my matches but they were wet. We were now very cold, wet, and shivering. We all set to pulling the long cogon grass and, when a considerable pile was at hand, crawled under it and kept our wet bodies side by side until we had become reasonably warm.

I dried my matches by friction against a smooth surface, and then started a fire with some difficulty. Leaving the others to heat our can of beans, I had started across the crater to a small lake with a cover of ice when I was soon startled by another "pistol shot." This time it was our single can of beans that had exploded over the fire. The cooks, not knowing what steam could do, had not punctured the can, and our breakfast was scattered for yards about the fire—here a bean, there a bean. When I returned the others were on their hands and knees hunting on the ground for the remains. It was a sorry breakfast.

McNamara and I climbed to the new crater and looked down into the great chasm from which the strong sulphur fumes were issuing. We kept to the windward in order not to breathe the offensive gasses. Then we all started down the mountain, traveling fast, knowing that food was waiting for us at the spring. John, lacking the stamina of McNamara and myself, became ill, but with the two of us at his side we hastened on down the mountain.

Finally we reached the former camping place. John and McNamara sank exhausted to the ground and I went to the place where I had so carefully hidden our supplies. But the food was gone! It had been stolen by rattan hunters, as the remains of a fresh campfire indicated. We set out at once for the agricultural station to obtain our much-needed breakfast, lunch, and dinner. We did arrive and indeed survived. Without too much exaggeration, our journey could be termed a second ill-fated expedition. And, remembering again my troubles with Mandalingan, I began to feel certain the God of Canlaon had similar attitudes toward hunters who would take his animals.

The following day I returned to Hinigaran and resumed my ordinary life, but there were compensations. Frequently at night, I went for a swim in the shallow waters near the shore. Myriad *Noctiluca*, those minute organisms that light up when disturbed by

motion of the water, were very active. As a result, my body could be seen brilliantly outlined in a robe of light, as could the fish and other denizens of the sea near me.

I have mentioned my pleasure with the company of Padre Rogan. If ever a man lived for his parishioners, it was he. He might be called at midnight to plod through rice fields to some obscure and distant barrio to give extreme unction to a dying person. Unfortunately for me, he was transferred elsewhere. His replacement was a somewhat younger priest who, I later learned, had been sent to Hinigaran for penance. After we became acquainted, he too was asked to be my guest on Sunday evenings. He was a Friesian by birth, educated in Paris, and at one time had been somewhat exposed to surgery and medicine, how I never knew. He treated malaria patients with quinine pills, but his practice was limited. He told me that since he had been in the Philippines, three sets of parents had brought him their children to have their tails removed. This curious deformity, which may of course appear in any people, occurs when the terminal part of the spine in developing fails to make a proper bend inward.

"Did you amputate, Padre?," I queried.

"I? Would I interfere with the Lord's handiwork?"

An estrangement grew between us in a peculiarly roundabout fashion. Two young Americans, one in charge of the schools at the large town of Binalbagan north of Hinigaran, the other in charge of schools at Himamylan, the large town to the south, were invited by me for Christmas dinner. My Chinese cook (Juan had been superseded) had promised us a feast.

A large suckling pig, stuffed with a considerable lot of spicy Chinese herbs and sporting a small ear of corn in its mouth, had the place of honor on the table. There were vegetables and a fancy cake, of which any competent housewife might have been proud.

Having eaten and enjoyed the dinner, we took a short siesta and then went down for a swim, since the beach was only about a block from my house. While resting on the beach after a swim, my guest from the south discovered a hermit crab dragging his molluscan house across the sand. He asked me what the creature was. I, always happy to oblige, explained that the crab was an ordinary creature, somewhat like the American "crawdad," that had envied the mollusc its house. When the mollusc died the crab seized its shell and thrust its body into the spiral. Eventually, the evolutionary process resulted in the crab now having the posterior part of its anatomy represented only by a large gut! I removed the crab from the shell and displayed the proof.

"But there is nothing to this evolution stuff," my guest said.

"So say you, but there is nothing in any philosophy that is more true."

"But if it were true the priests would certainly know about it." There was a religious problem.

"If they were smart enough to know they probably wouldn't tell you so!" From his reaction I realized that I had lost a friend.

Repercussions of this conversation were to spread widely. Returning to Himamylan, our man seemingly reported the dialogue to the priest. The priest, aware of the danger, reported to the bishop, who resided in Iloilo on the nearby island of Panay. The bishop, in turn, had reported to the archbishop in Manila.

The Sunday evening of the second week following Christmas my friend, the local padre, did not arrive for dinner. Some days later, I stopped at the convent where he resided and was told by his muchacho that the priest would not see me—"No, he is not sick."

I was astounded, for I could not imagine how I might have offended the priest. I saw him at a distance in the street some days later, but he turned off and went in another direction. About ten days after that incident we both happened to be in the post office at the same time, and I demanded in no uncertain way an explanation for his behavior.

He explained. "I have orders from the archbishop in Manila to hold no converse with you as you are trying to proselyte our people [Catholics]."

Now I have always cared little if my beliefs were accepted, whether in religion, politics, or science, for I was in no sense a missionary—not even in a minor capacity. But I was unhappy about the aftermath of the affair, which was fairly predictable. The story that reached the provincial capital as well as our own town was that the priest and Taylor had had a fight over the postmistress. And, I felt strongly that the archbishop, whom I did not know and had never seen, should be the object of some retaliation.

Vacation time soon arrived and I decided to make one more trip up Canlaon, at least to the lower parts of the mountain. I went alone, borrowed a horse at the agricultural station, and revisited areas where I had found specimens on the two previous occasions. I was fortunate in again finding most of the forms that I had regarded as new, and this time there were no untoward accidents. I also wanted to visit Manila during this vacation because I had heard that the ichthyologist of the Bureau of Science was planning to leave the Philippines, and I proposed to apply for the job. Although I had few qualifications for such a position, I thought I could learn.

In 1916 I returned to Lawrence with the intention of attending summer school and, if possible, completing work for my M.A. at the University of Kansas. I also hoped I might find someone to replace my former girl friend who, following a "Dear John" letter, had

become a seemingly happy housewife of a man who had been a very good friend of mine.

At my fraternity house the housemother introduced me to some of her acquaintances, one of whom, Hazel, stimulated more than casual interest. I was invited to her Kansas City home after summer school, and later joined her and her family at their summer home in Michigan. We played together and swam together and I suddenly realized that I wanted her for a wife, doubting greatly that she would accept me. It took me several days to develop the courage to propose marriage, and happily I found that my feelings were reciprocated. With much reluctance because of the short time available, the wedding invitations were telegraphed, and the family dressmaker produced a trousseau and wedding gown for the bride, and gowns for the bridesmaids, since the wedding ceremony was to be a formal one in the Episcopal church in Kansas City.

The affair went off without a hitch and after cake and champagne we were off to the railway station to start on our journey to the Far East. As we passed through Lawrence enroute to San Francisco, our train was boarded by some 25 of the bride's sorority sisters and somewhat fewer men from my fraternity bent on giving us a farewell sendoff, much to the discomfiture of the conductor and the dispatcher.

We had been able to acquire passage on the boat, but my bride was forced to accept a place in a stateroom with an elderly lady, and I had half a stateroom with an elderly but very agreeable man, a tourist also bound for Manila.

We made a short stop in Honolulu and had the thrills provided by the bands, the singing of "Aloha," and the exquisite leis with which the passengers on board were welcomed. Our next stop was Japan. As soon as we were through customs in Tokyo we obtained passage by rail to Kyoto, where we had reserved space.

Here our long delayed honeymoon became a reality.

We went to Tokyo on weekends and attended some ancient No plays, and saw two modern plays. The clever Japanese provided programs in English for the handful of Americans and English who were patrons of the theatres. We also learned much of the great city of Tokyo. From Japan we moved on to Manila and back to work again.

14. ZAMBOANGA

I was soon offered a new and better position in Manila as Chief of the Fisheries. My offices were to be in the Bureau of Science, where I also was able to house the herpetological and ichthyological collections. There were several large desks, four large aquaria built in the walls, and adequate space for research and entertaining visitors. My work was varied, and I became acquainted with men

in other departments of the bureau, especially with our elderly director, Dr. Cox, who owed his position to the "Great White Father"—seemingly they were related.

The most frequent visitor was Padre Sanchez, an elderly botanist from the Jesuit University in the "Walled City," the older part of Manila. He was extremely well-known and highly respected by the Filipinos since he had, in Spanish times, been exiled to Mindanao with José Rizal, the famous martyr of the Philippines.

The padre occasionally brought other younger members of the Jesuit faculty. One was especially interested in mammals, reptiles, and fish, and occasionally brought specimens for me to identify. Probably for the first time he saw together groups of related species of a single genus, or groups of specimens of a single species from various islands, displaying slight differences stamped on their bodies by the island environment. With the examples before us I suggested that evolution had been at work to bring about all these changes. He did not take offense at the explanation despite the fact that evolution then was considered an anathema by Catholics, and was almost a forbidden word. He returned on various occasions and would usually concern himself with the problem of speciation. But suddenly his visits stopped completely.

Some time later I was returning specimens I had borrowed from the Jesuit museum, and on being received by the head of the Jesuit institution, I asked for the former visiting padre.

"Why do you wish to see this man?" he inquired in a somewhat severe tone.

"I am returning borrowed specimens and I know he is in charge of these collections and holds my receipt."

"I will send you another."

He left and I was joined by another priest who received the specimens. I made no queries concerning his predecessor.

Two weeks later a young man came into my office. He was in ordinary citizen's clothing. I suddenly realized it was my former visitor, without his long floor-sweeping cassock.

"¿*Qué es eso?*" I exclaimed.

He explained in reasonably good English that he had left the Jesuit order; that a Spanish friend had given him the clothing he was wearing; and, that he was hoping to earn sufficient funds to return to Spain. He wondered if I had any ideas that might be of help, for the order seemingly had retained any property he might have had.

"You would give lessons in Spanish?" I queried, remembering the recent arrival of several Americans now living at the Y.M.C.A. who wanted to learn Spanish. He was agreeable, and a telephone call arranged a meeting between the group and the proposed teacher. Agreement was reached and the class was begun.

Journeys to various parts of the islands kept me away from Manila for a time and later, when I inquired about the teacher, I learned that he had returned to Spain, having obtained passage on a freighter to Barcelona. I have since wondered many times about the fate of this young man on his return to Spain, now observing a somewhat different world, riding perhaps on a new philosophy.

Shortly after I had been appointed Chief of the Fisheries of the Philippines, I acquired a small boat, formerly a ship's lifeboat, for my department's use. It was broad and, like all lifeboats, capable of riding rough seas. A gasoline engine and gasoline tanks were installed in it, and a canopy was set to cover it. The boat could make about six knots an hour, when the engine was running; but occasionally the engine would fail, at which time the boat would wallow in the waves. We could move only slowly under muscle power with oars. At this point I also acquired a permanent engineer and muchacho, young Tagalogs (the name for the people and language of this part of Luzon). Numerous trips were made to Luzon ports not far from Manila, and the cultivated fish farms common around Manila Bay were studied. But I rarely ventured far from sight of land and concerned myself with the barometer and clouds as well as with the uncertain weather reports.

The director of the Bureau of Science suggested a journey to southern waters and the extensive Sulu Archipelago, lying between southern Mindanao and Borneo. My boat was placed on an inter-island ship for transportation to Zamboanga, a port on southwestern Mindanao.

One passenger on the ship was Baron Waller, a newcomer to the Philippines from Austria, who had planned to accompany me on the journey. Just before the ship was to leave, I was tipped off by a Swedish secret service man that the baron should not travel on it. Knowing the man, I acted on the warning and told the baron what I had learned. The baron said, "This man knows his business?" I said I was certain that he did. At the last minute I had the baron's baggage removed from the boat, and he disembarked just as the gangplank was being removed.

The ship left about four in the afternoon, heading out through Manila Bay and south. Late in the evening I was on the bridge with the captain when we noticed the approaching lights of another ship, which signaled for us to halt. Our captain, a Spaniard, considered this an insult and voiced his opinions of the boat and its officers in vociferous and very profane language. He definitely would not stop. Shortly afterwards there was a bright flash, accompanied by a cannon report. Still the hardheaded captain continued, not allowing himself to be bluffed by blank shell. A few minutes later a cannonball passed high over our ship and the patron stopped.

The other ship stopped next to us, and we were boarded by

British officers and two sailors. As the patron spoke no English, I served as interpreter. The first questions were perfunctory. Where were we going? What did we carry? Then they wanted the passenger list. On observing the name of Baron Waller, they asked that he be brought up. I explained that illness had prevented his traveling, although he had come aboard and his baggage had been removed just prior to sailing. They also inquired about a Swedish National whose name was on the passenger list. I said that he had failed to appear. The British thought they were being deceived and searched the ship despite my candor. Their search yielded nothing and they finally left. My Swedish acquaintance had seemingly known his business.

The remainder of the trip to Zamboanga was uneventful. On arrival, my boat was removed from the ship. My "crew" found lodging at a small inn, while I proceeded to the hotel and engaged a room, which happened to adjoin one occupied by a baby orangutan (man of the forest). Its playmate was a small dog, and both were owned by the proprietress of the hotel. The two animals were the best of friends. I spent considerable time observing this baby arthropoid and marveled at the similarity between its activities and those of a young child. Sometimes its mistress found occasion to administer mild punishment and the ape would run to its bed, pull up its covers, and whine, or make equivalent noises.

I decided to visit Basilan, an island not far from the tip of the peninsula of Zamboanga. It was mountainous and promised to provide good collecting ground. We obtained the necessary food and supplies for the journey and started across the channel separating the island from the mainland of Mindanao.

The island's inhabitants were for the most part Mohammedans, or Moros, of Malay stock. But in the large village of Isabela there were numerous Filipino merchants, while on the coast several planters—Americans, Japanese, and an Englishman—were preparing land for cocoanut plantations.

At Isabela we anchored in a small harbor that offered protection to boats. We tied up to a piling at the pantalon, or wharf, and then obtained shelter from a trader who ran the government store.

We began work here, going into the forest during the day and making the journey back before night. In the evening we waited for the fishermen in small sailboats to dock in the tiny harbor at Isabela, examined their day's catch and noted the kind and quantity taken. We questioned the fisherfolk on their average catch, number of days fished per month, methods used, and the size to which the various fish species grew. From the presidente of the town, I ascertained the number of persons holding fishing licenses and could thus make rough estimates of the annual catch from Isabela.

One day I joined a local fishing boat on the invitation of the

owner and spent the day watching the fishermen, noting on my charts water depth compared with the depth to which their lines reached. The following day we left in our own boat for a trip around the island. We landed late and camped near Abung Abung, a village by the beach.

In the two days spent there, many fine herpetological species were obtained, including my first specimens of caecilians, which were found under rocks or rotting logs. Large earthworms more than one foot long were picked up and examined, then discarded. The first caecilian was picked up, mistaken for a different species of earthworm, and it too was thrown down. I noticed, though, that it moved more like a snake than an earthworm and I picked it up again and examined it carefully. It was no worm. It had a mouth with four rows of teeth! I realized what I had, and searched until other specimens were also found. This new species was later named *Ichthyophis glandulosus*.

I pursued my collecting for a time, then decided to return to Zamboanga before starting to the wilder parts of the Sulu region. We left the mainland of Basilan and, because of high waves, stopped after dark in a Moro village on a tiny islet. The village actually had been built on pilings and was situated entirely over seawater. We came in quietly, tied the boat to some isolated pilings, slept in the boat, and left before daylight since the waves had subsided. The people were seemingly unaware that we had spent the night in the village.

After a short run the engine began to act up, and when it quit we started rowing to Zamboanga, keeping close to the shore of Basilan in case a squall came along. Soon we noted a large dugout canoe with outriggers putting out from shore with several natives on board. They were coming directly toward us and I became apprehensive when I discerned that all were carrying krisses, those sinuous swords with sharp double edges. They seemingly meant to harm us. The engineer said, "They will kill us, Señor; better you shoot first." But I was unconvinced. They signaled for us to stop as they rowed in front of our boat; two of them came aboard. I could not understand their rapid questioning but yelled and shouted "Aco Americano," "Gobierno Americano." The engineer tried to answer them in Tagalog but I am sure they did not understand what was said. Finally the two men returned to their dugout, apparently appeased. It seemed they thought I was an English planter, or so I assumed when I understood their word *Ingris*.

We went on to Zamboanga, but it was another three hours' pull before we reached the town. While rowing, we saw a launch cut across from the northwestern part of the island to the peninsula. At Zamboanga, we found a party of constabulary just starting to Basilan. They were going to investigate a report from a Japanese planter

that a party of Moros had landed at the Englishman's plantation, killed him, and, reputedly, thrown his body into the sea. When I reported the incident of the Moros boarding my boat, the constabulary major concluded that they were the guilty parties. He asked me to accompany him to Basilan and if possible identify them.

The swift constabulary launch took us to the plantation, where we found the body, terribly slashed, the head almost completely severed, in a pool near some rocks. It was hauled to the surface and taken ashore. Closer examination revealed a number of major cuts; each assassin apparently contributed his stroke so presumably all were equally guilty.

I suggested that a good place to start inquiry might be the point on the shore where the men were seen entering the outrigger canoe, a place we soon reached and, indeed, there was a large outrigger that had recently been pulled up on the sand. I could not be certain that this was the boat that stopped us, but it was the one used by the assassins, for blood was smeared on the inside.

This convinced the constabulary that we were on the right trail. The discovery of a path leading back to some clearings looked promising, but the houses were empty. Thinking they could not be too far ahead of us, we followed paths that led back toward the hills. We had ascended a considerable distance when I, looking for all and sundry animals along the path, suddenly discovered broken twigs at the side of the path for two or three yards. A minute's investigation showed where one or more persons had left the path, headed to the right. I suspected there might be a shelter nearby, built for protection from rain or for the use of woodsmen gathering rattan in the forest. The constabulary sent four scouts in all directions and, after some time, one reported seeing a group of Moros cooking food near an old shelter, about four hundred meters away. The rest of the soldiers returned with the scout, and the Moros were soon surrounded and called to surrender.

Of the original seven, five were captured. What became of the other two we did not learn. We returned to shore with the prisoners and then were off to Zamboanga.

15. THE ISLAND OF SINBAD

It was late at night but still hot when we returned to Zamboanga. I went straight to my hotel, for it had been a long and very harrassing day and I was tired both mentally and physically. But sleep was a long time coming, and when it did come, I was plunged again, dreaming, into the events of the day. I awakened from my fitful slumbers with an apprehension of immediate danger and my mind flashed back to the thing that had been pulled out of the water and which a few hours previously had been a man. I could see the frightened mother and her children, who had barricaded themselves

in the house near the shore, likewise expecting to be killed as the father and husband had been, for they had watched the murder from a distance and were assured of safety only by our belated arrival. Then back to sleep; but, troubled sleep.

In the morning I was rudely awakened by a sudden crash as my hotel neighbor, the young orangutan, knocked over the screen that stood in front of the open door of my room. I jumped up and saw the creature sitting placidly on the screen. It had carried some of its toys with it, which it placed on top of its head. Then they were allowed to fall to the floor. When the toys were recovered, the game continued, in the same fashion.

The next day I found my two "crew" members waiting for me when I went to the boat. We set about getting several five-gallon cans of gasoline to fill our tanks, keeping extra cans to take along for emergencies. I reported to the constabulary headquarters and talked to the colonel, who insisted that I carry a constabulary guard on my boat. He said if we went alone, we might not be heard from again. The constabulary guard was a bit of visible insurance.

Of course, there was no argument. Our guard consisted of three soldiers, all Visayans from the middle islands of Panay and Negros. All spoke some Spanish, and one had learned a little of the language spoken by the Moros in the Sulu Archipelago.

It was afternoon by the time all the arrangements had been completed, so I decided to depart the following morning and spent the late afternoon collecting in the hills back of Zamboanga. I stopped to have a swim in the city swimming pool fed by a small stream from a spring; it was a welcome relief from the tropic sun.

In the early morning we left Zamboanga and traveled south, past Basilan, where we had already collected and had encountered the murdering Moros; then to Bubuan and Bulan. Our boat was so low in the water that on the curved surface of the ocean, so like a ball, our first glimpse of the islands along our route was distorted and consisted only of the bushy tops of coconut palms or other trees. As we drew closer, the trees seemed to rise out of the water, and short trunks became visible; closer still, the trunks grew longer. If we were approaching a coral island, we would have to be even closer before we could see the white line that marked a beach of coral sand from breaking waves. We stopped at one of these small islands, one not marked on our map. It appeared uninhabited, and as we approached we came upon a coral reef three or four hundred yards from the shore. Circling the island, we found no place where we could get our boat into the lagoon and close to shore. Not to be thwarted, we anchored the boat on the reef and I swam ashore, carrying collecting sacks, to gather specimens in the forest. Ordinarily, even a pair of boots is none too good for the rigors of collecting, and certainly bare feet and legs complemented only by a

bathing suit is no improvement. In a few hours I took several specimens of lizards. I also found two biscuit-shaped eggs plastered against a tree trunk, each nearly an inch in diameter. I knew they belonged to some species of gecko but to that point I had found nothing on the island to account for eggs of that size and character. I pried them off carefully, intending to keep them until they hatched.

Shortly before leaving the island, I felt a sharp, rather violent pain on my foot and discovered a small scorpion had stung me after I stepped on it. I knew that scorpion stings were painful but felt certain there was no serious danger. The pain increased, running up my legs to the groin, and within twenty minutes that region began to swell. I was mildly alarmed, as intense pain frequently brings me to unconsciousness, and I was fearful of trying to swim to the boat. Swelling continued but at the end of half an hour the pain lessened somewhat. The swelling, however, spread and the glands under my arms became affected. I lay down for an hour, and the intensity of the pain was so reduced that I returned to the beach and started what seemed an endless swim back to the boat. The men helped pull me onto the boat after taking my sacks, which I had tied about my neck.

One of the eggs, which were in a tiny sack, was broken and you can imagine my surprise on finding in it an abnormal gecko with two heads. It was the same species that I had found two years before in the interior of Mindanao in Manobo country. The other egg contained a normal gecko.

These double-headed curiosities are found in all species of animals—snakes, turtles, and even humans—but they are merely incomplete identical twins, accidents of nature, and do not constitute a separate species or kind. One can suppose that stories of two-headed giants are based on the fact that children as well as geckos are sometimes born with two heads.

Our first night we stayed on another small, uninhabited island. We got the boat ashore through the reef and anchored in the clear quiet water of the lagoon. We cooked rice and heated canned salmon. My cot was placed ashore; but the other five slept on the boat. The night was uneventful save for a shower, which did not awaken me although my net and blanket got wet.

Another day, and another; islands, reefs, wonderful fish, a whale in the distance. One day a squall rose and we ran for safety behind a small island, entering a lagoon. I did not dare take chances with the boat, and not one of the other men aboard could swim; loss of the boat might mean loss of all hands. Of course, the soldiers were afraid of the sea, being from interior towns. My two men, however, had had sufficient experience so that they were enjoying the trip, more or less. However, none of the five could be brought to touch a snake or even a lizard, so all collecting was left to me.

One day, as we were coming in sight of two islands separated by a narrow channel, I saw, at perhaps a quarter of a mile, what appeared to be a wall of water approaching us on the quiet sea. I had never seen anything like it but remembered reading of tidal waves; these usually were the result of great earthquakes, however, and we had experienced only small shocks not worth mentioning. Then I remembered tide-rips, small tidal waves that develop as a result of the shifting of the tides in island regions. This must be a large tide-rip; the force of which could easily overturn the boat. I immediately ordered the engineer to change course; the outer part of the wave passed us and the boat tossed wildly for a minute or two, but we did avoid the riptide. Had we met the main part of the rip head-on, which could have happened at night, someone else might have written this story.

We next came to a very rocky island perhaps a hundred feet high, with an area of coral beach. I decided to stop there since a squall appeared to be forming ahead of us. We passed the reef without difficulty and reached the quiet lagoon. Dressed as usual in bathing trunks, I jumped into the water with a rope and pulled the boat up to the beach so my men could set up camp. No sooner had we beached when by the side of the boat there arose from the water a sea serpent, a *Laticauda*. Its size and diameter astonished me and I captured it, later to discover that it had swallowed an eel three-and-a-half feet long, besides containing many unborn young. Preparations for the evening meal went on as I removed the eel and preserved the snake. The species was one of the three kinds of sea serpents, related to cobras, that can crawl on land. Most sea serpents, if tossed on a beach by a wave, simply lie there, and if they are in the sun they die, since they usually cannot crawl the two or three feet to the water. Almost all sea serpents are deadly poisonous, but, despite that fact, they are not aggressive. If one picks the serpent up by its flat, oarlike tail, the snake is entirely helpless.

I was in for more surprises when I took a walk along the beach and found under every coral head and each piece of driftwood smaller snakes of this species. I walked back to the rocks, and every crevice and gap was filled with snakes; between two rocks was a specimen some six feet long with a brood of thirty or forty newborn young. I had heard of such islands of snakes. The most famous was that of the fabled traveler Sinbad, and I thought perhaps this was the island he had visited and about which Scheherazade had spoken one night.

It grew dark. The lantern was lit and I was called back to rice. I did not tell the men what I had found, as they were already disturbed enough by the snake I had caught.

The next morning, I had the boy start breakfast while I set out to climb the higher rock masses. Everywhere I looked, wherever

there was shelter from the sun, there were snakes. I could have caught hundreds—perhaps a thousand—but I was content with a small series. When we were ready to go I took the soldiers and the boys back among the rocks so that they too could tell their unbelieving families of this fabulous island of serpents.

Other such islands in the Philippines are now known, and in recent years the Japanese have taken incredible numbers of serpents from such places. The serpents serve both as food and as a source of fine leather in Japan. The Philippine government currently protects these snakes by limiting collections and demanding that the collectors purchase a license.

After leaving our "Island of Serpents," we cruised for three more days and visited several other islands. On one beach I found a large number of old shells of the oyster species that produces pearls and wondered about an opportunity for a pearl fishery. This island was not surrounded by a reef, the coral seemingly growing only on the leeward side.

In many of the lagoons we found *bêche de mer*, the so-called sea cucumber, those strange sea animals that look like great, thick worms ten to fourteen inches long with a leathery skin. When dried they are used for food by the Chinese. I collected a number of these animals which, when placed in a bucket, eviscerated themselves, throwing out of their bodies the digestive gut, liver, and other internal organs. This does not kill them, and if they are put back in the sea they will grow a new set of organs. What was most amazing was finding a symbiotic species of fish that lived inside the digestive tract of the *bêche de mer*, a very slender fish whose fins had all but disappeared and whose body was nearly transparent, without any color except that of translucent flesh. They enter the sea cucumbers by the anus and apparently do them little harm, save that of appropriating some of their food.

There were many starfish, curious animals usually in a five-pointed symmetry, but sometimes with ten or fifteen arms. If these animals are cut to pieces and thrown back in the sea, many of those pieces with an arm attached will live, grow, and regenerate a new starfish. In several areas the starfish feed almost exclusively on oysters and often can completely destroy the commercial beds.

We either avoided islands where we saw villages or landed as far from them as possible. One day we landed on a rough island half a mile long, which appeared uninhabited. The soldiers went ashore, hoping to find some *balud*, wild pigeon, and I climbed to the top of a small, rocky hill. From the summit I saw a group of Moro men on the shore near an old shack, and they saw me. Immediately they got their weapons from their boat and came toward me. Thinking retreat the better part of valor, I retreated, going back to the place where my soldiers were hunting *balud*. The Moros reached the top

of the hill where I had been a few minutes before, and finding me still in sight, thinking that I was alone, they started yelling and running towards me before I gained the cover of the trees. Thank goodness the three soldiers were near enough to hear my shout. Seeing me running and hearing the Moros, they grabbed their rifles and advanced.

When the Moros were within fifty yards they saw the soldiers, one of whom, a corporal, called to them to halt and shot his rifle over their heads. This stopped them, and two began running the other way. The corporal and I started toward the remaining three intending to find out their business on the island, but they too turned and ran back across the hill. We gained the summit just as they started rowing off, presumably to an island about three miles distant. I suspected that they were preparing to dive for pearls. Or they could have seen smuggling in opium or silks from Borneo and did not want to be found out.

Our food supply was growing short and we put into the harbor of Jolo, a town on the large island of the same name. Here lived the American governor of the Sulu country and also the famed Sultan of Sulu who was, and always had been, a very unwilling subject of the United States of America. He claimed the Sulu Islands as his own, as well as a large territory in the great island of Borneo, for which the British government paid him an annual rental of several thousand pounds. Moreover, he claimed that the Spaniards had never conquered his people and that his was a free country. But the Americans had heard a different story and this island territory had been ceded to America at the end of the Spanish-American War. So the conditions in Jolo had never been good.

At Jolo, the soldiers were quartered with the constabulary and my muchacho and engineer with a Filipino family. I obtained accommodations at the governor's. The city was now comparatively safe and presumably amply guarded by constabulary, so I began my collecting. On two or three journeys I was accompanied by an American, Captain Link of the constabulary, who had an interest in natural history and enjoyed hiking. He was probably the only American on the island who carried no gun. He was reluctant to explain why it was unnecessary, but the governor told me that Moros had killed some of the soldiers on patrol and had thrown their heads in his yard. This had been too much for the small quiet officer, and he declared war in earnest. He put up a row of bamboo poles in front of his house and on these affixed the severed heads of certain Moro outlaws; there they stayed until they were grinning skulls. Two could play at the game of heads.

Collecting was uneventful and not especially successful. One day I planned a trip to the old mountain, Bud Daho, where General Pershing had fought his famous battle. I went alone, armed with a

bolo, a revolver, and my .22 rifle. I found a faint trail and climbed to the summit, often having to chop away the strong ground-fern masses that hid the path. I collected around the summit and around the old trenches, finding a few lizards and frogs. I ate my lunch in the middle of the afternoon and then had a siesta. I slept too long, perhaps because of weariness from the excessive heat, and when I awakened, the sun was low. I had been careless in marking my way and could not find the path by which I had ascended. Finally, exasperated, I started clambering down through the fern masses that covered the long slope. But this was slow, because heavy, strong, wiry stems were very tough for my bolo, now dull. I had made some progress but the sun was sinking even lower. I finally placed my sacks in a tube of bamboo, got on top of the fern masses, which grew to three or four feet above the ground, and literally rolled down on the tops of the ferns, sometimes rolling twenty or thirty feet before falling through to the ground. At any rate it was much faster than climbing down, and before dark I reached a grassy area and was soon on a trail leading to a carabao road.

I returned to the palace to find that the governor had ordered the constabulary to bring in my "remains" (thinking I had been killed), and they were on the point of leaving for Bud Daho when the "remains" walked in. The governor hinted that for his peace of mind I should carry a guard or a companion on future journeys. Perhaps he thought two people together could not get lost.

The next day I had an invitation from the American engineer to accompany him across the island, where a road was being constructed. The workmen, chiefly Filipinos from northern islands, were doing the work under protection of the constabulary. Our conveyance was an old Ford, actually a great-grandfather of the old Model T, without a top. The engineer drove and I sat on the seat beside him, armed, at his insistence, with a revolver, cocked and ready for action. Part of our road lay through fields of cogon grass, eight to ten feet high—and the heat was of inferno intensity. We passed by two or three very low, extinct volcanoes, their cones perhaps less than a thousand feet high.

At the road camp, we found that a band of Moro outlaws had attacked the night before. A number of shots had been exchanged, but no one was killed or injured.

After a short stop we went on to another road camp at the east end of the island on the edge of beautiful Siet Lake. Here I spent some time looking about for specimens. I discovered a tree gecko that was a species new to science, and to my knowledge no second specimen has been taken. The specimen was lost for a number of decades, in a jar with many common house geckos. Upon its rediscovery, it was described and named *Luperosaurus amissus*, the lost one.

On our return journey I persuaded the engineer to stop near one of the volcanoes. There was forest at the very top and short grass covered the sides. I especially wanted to examine this bit of forest so we left the car and started up the side through the grass, which became shorter as we ascended.

We had scarcely left the car when a shot suddenly rang out and the engineer jumped and turned. "Where did that come from?" he asked excitedly. "The bullet went by my head." I realized that my own cocked gun had discharged accidentally, so I exercised my imagination and remarked that I had been gunning for a lizard but had not hit it. His fears were allayed. And, the bullet really had not been too close to his head.

We reached the trees in less than an hour's climb, and at the top observed in the crater a deep-blue lake that looked cool and quiet. We decided to go down and swim. Since the walls were quite steep on our side, we cut a rattan palm with a long snakelike trunk and let it down so we could pass the steeper parts with some aid and have an assurance of getting back out. We soon reached the water, some 500 feet below the summit. Lacking bathing suits we disrobed. I was on the edge of the lake, the engineer thirty feet above me in low brush. Suddenly he let out a shriek and yelled "CROCODILE," and a moment later there appeared a naked man with his clothes held high and a huge crocodile, disturbed from his siesta, almost immediately behind him. The crocodile was trying to reach the water, too, probably amazed at the sight that preceded him.

When the crocodile disappeared in the water we found a place where a tree trunk, fallen at the edge of the lake, gave us a measure of protection and some clear water. We bathed but did no swimming. Within ten minutes, more than a dozen large crocodiles had surfaced and were lying some distance away on the water, expecting a helping of meat. We dressed, ascended to the summit, and journeyed uneventfully back to the city. I conjured up no more imaginary lizards for targets.

16. LEDNICKY AND THE MERCURY HUNT

One day my good friend Victor Lednický, then Chief of the Division of Mines and Mining in the Bureau of Science, came into my office and notified me of a new assignment for us. Victor had been a student at the University of Kansas with me and we had maintained our friendship here in the islands. The United States, threatened by war, was in dire need of mercury for munitions, and the supply was very limited. Could other sources be found? On previous occasions samples of a reddish mineral, known as cinnabar and containing mercury, had been sent to the bureau from various points on the islands of Mindoro, Busuanga, Palawan, and from one

or two other smaller ones. Our job was to investigate these places to locate the sources of these samples.

We left Manila by launch, a comfortable one supplied by the government. I took my collecting kits and preserving materials, as usual. Our first stop was on the northwestern coast of Mindoro at a large cattle ranch where the government manufactured a serum for treating the domestic carabao for the dread cattle disease known as rinderpest.

We ran alongside the small wharf. Victor took his gun and walked to the marshy mouth of a small river to try for wild ducks, while I took a short journey through a pasture to some forest near a large swamp, hoping to find reptiles or amphibians. I had not gone far when I found a snake and later captured some lizards. I came upon a sort of path that had been made very recently. It looked as if a very large object had been dragged through the grass and through the edge of the forested area. I followed it some distance, noting the tracks undoubtedly left by a crocodile in the wet mud. But surely, I decided, one crocodile alone could not have made this trail; it must have been dragging some heavy object.

I followed the tracks until they disappeared into the water. If one of the cattle had been killed, it had been hidden somewhere in the deeper parts of the swamp. Since it was getting late, I returned to the laboratory and reported what I had found. Indeed, one of the cattle was discovered missing, a young Indian bull which was said to weigh 800 to 1,000 pounds. The next morning a search was instituted and the remains were found in the water some distance from where the trail ended. The crocodile, which we did not see, must have been very large to have killed an animal of this size and then to have dragged it such a distance.

We learned that the cinnabar sample sent from this place had been obtained from a native in a passing boat, but where the native had gotten it no one knew. The next morning we started south along the west coast of Mindoro, making stops at two points to check unconfirmed reports of red stone. But we found nothing resembling cinnabar. From there we crossed Apo Pass, heading toward the island of Busuanga, where we were to spend the night. At our next stop, near a settlement on Busuanga, we learned that the sample of cinnabar sent from here supposedly came from Culion, a neighboring island where the great leper colony was situated.

While Victor was consulting with the local officials, I took a walk through the forest. In a high tree I noticed a plant which I suspected was an orchid, one not previously seen in my journeys in the Philippines. I tried to cajole some of the natives into climbing the tree and bringing the plant down, but, even with a good reward offered, no one would do it. Too dangerous they said. Finally, I attempted the climb myself, dangerous and difficult as it was. I

reached the plant and lowered it to the ground with a strong fishing line. The plant was nearly twelve feet in height, but bore no flowers at this time. We made a kind of hammock for it under the awning of the launch, since I planned to take it back to Manila and keep it until it had flowers.

The next day we stopped on Coron, a somewhat formidable island apparently formed of solid limestone with very little soil cover. The surface of the rock is covered with small sharp points of limestone than can pierce all but the stoutest shoe leather. We rowed our boat close to shore; Victor and I jumped out and clambered up the side of the seawall, pausing everywhere to look at the curious plants growing in the rock. The plants looked as if they were growing in a desert, despite the fact that the island has a heavy rainfall.

We found a cave that had served as a burial ground. In it were left coffins, hewn from rough logs and brought from one of the neighboring islands. We finally reached the summit of the wall and, crossing a deep dry gulch, came upon several small caves which showed signs of human habitation sometime in the past. The caves had been occupied by bird's-nest hunters during the nesting season of the swifts, *Collocalia*. These curious cave-dwelling birds build nests from materials which are cemented together by secretions from their salivary glands. The cement is similar to a hardened gelatine, and it is famous as the base of Chinese bird's-nest soups. The birds place their nests on the walls of caves, and the hunters use notched bamboo poles as ladders to reach them. The nests are small; it would probably take as many as ten to make up a pound.

We found very few living animals on the island. Just as we were about to descend to the water's edge to return to the boat, however, I obtained my only herpetological specimen, a harmless slender bush snake that lay motionless on a small shrub.

Our next stop was at the leper colony on Culion, not altogether a pleasant place to visit. We were surprised to learn that children born of two leprous parents might be wholly without the disease. On leaving we walked through a shallow liquid solution to prevent carrying on our shoes anything that might transmit leprosy.

The orchid we took back was given to a friend who had an orchid garden, with a German gardener in attendance. The plant later produced its flowers, a huge panicle with some fifty blossoms, and the lateral petals of the blossoms measured more than four inches in length. The panicle and part of the stem were sent to the noted Boston orchidologist, Oakes Ames, who regarded it an undescribed form. When America declared war on Germany, the gardener, together with certain orchids (including my rare find), disappeared from the McCrory garden. He escaped from Manila on a merchant

boat. No one could be certain that he had taken the plants, but I suspected he had.

I must confess here to a genuine interest in orchids and I have collected as many as I possibly could. The species are legion, and there are more than 500 in the Philippines. One form, almost like a tiny tree 10 to 15 feet high, can sometimes be found growing on a beach that receives salt spray. The flowers are large and leathery, but scarcely beautiful. Perhaps the most extraordinary orchid plant was found growing in sand near a small stream in Mindanao. It lacked leaves but had several hundred small, greenish flowers. I traced the roots and found the plant attached to a bit of rotten log buried in the sand.

I collected part of the plant to take to Dr. Elmer Merrill in Manila, who has written much about Philippine plants. I told him I had discovered the strangest possible orchid, which must be new. When he saw it, he casually remarked that it had been discovered perhaps a hundred years ago. But, in all his Philippine collecting, he did not know of any specimen that has been taken in the islands. Later I also found another unusual orchid, with flowers partly of blue. This specimen was sent to Oakes Ames, who did me the honor of naming the plant *Dendrobium taylori*.

17. MANY LITTLE FISHES

For several weeks after our return from our hunt for mercury, I was kept very busy at the Bureau of Science in Manila. One of my new duties involved the supervision of the large aquarium, where often more than a thousand fish were kept alive. In conjunction with this, I wanted to try stocking some of the mountain streams of the Philippines, which were lacking in any species of game fish, with trout or bass, since I suspected that both trout and bass might do well there. Bass ordinarily do not require mountain streams, but in the tropics they require the temperature that mountain streams can provide. Knowing that bass had been introduced successfully into the warm Hawaiian Islands, I purchased some young fry there and had them sent to the Philippines. A pond was prepared for them at Baguio, a town in northern Luzon with a considerable elevation, where it would be cool enough for them to thrive. They learned to utilize as food a species of snail that grew abundantly in the water. After the bass were about six inches long I took a few down to Manila to try to acclimatize them to the warmer temperatures of the lowlands. The fish were released in a small pond built on the grounds of the Bureau of Science. Since there was no food in the pond, it was necessary for us to feed them daily. They soon learned to swim to the shore for food at a given signal, the slapping of the water's surface with a small paddle. The fish even took food offered by hand and were not intimidated by the children who often came to help in this task of feeding. The fish thrived for about three years.

One day two of the fish, at that time nearly ten inches long, failed to report for their meal, and an investigation was instituted. The guard at the bureau was assigned a special watch during the succeeding nights, but three days later another fish was missing. The following day the culprits were discovered. While I was feeding the remaining fish, I caught a glimpse in the water of another creature—a strange snakelike fish nearly two-and-a-half feet long, called *Ophiocephalus*, the snake-headed fish. Using nets, we carefully seined the pond and caught two of the carnivorous fish; they undoubtedly were the destroyers of my bass. These predators can live for several hours out of the water, and they crawl across fields and highways, following rivulets if possible. At night, they move from pool to pool, destroying all the fish in each pond as they go. I had to build a fence of finely woven wire around my pond to keep these fish from getting in the water.

One of the animals kept at the Bureau of Science was a macaque monkey. Her lodge, where she was tethered by a long chain, was by the path leading to my fish pond, and each time I passed she would leap to my shoulder and search my pockets for peanuts or other food. One day she failed to appear for the pocket search but had instead busied herself in her lodge. I investigated and found that somehow she had acquired a tiny bleary-eyed kitten, seemingly half-starved, which she was holding in her arms, human fashion, searching its fur for evasive fleas. She behaved like a little girl with a new doll.

I got some canned milk for the kitten, but the monkey refused to release it, or to allow me to approach her. She disappeared into her lodge. The kitten must have found the milk eventually, however, for it had begun to take on a well-fed appearance. But the monkey still would not let anyone touch the kitten. If the kitten attempted to get beyond her reach, it was apprehended and held in her arms. One day I heard the monkey screaming violently and observed that the kitten had wandered some distance from her, so I picked up the kitten and carried it back to the scolding monkey. As I approached, she landed on me and gave me a furious bite on my shoulder. Then she snatched the kitten away and disappeared into her lodge. A few days later the kitten disappeared for good and the monkey frequently whined and whimpered for several days, seemingly grieving for the adopted young.

Since leaving the Manobos in Mindanao, most of my journeys had involved sea travel and my visits were chiefly along coastlines and to small islands. I thought the high mountains of Luzon in contrast must be inhabited by interesting animals and species different from those occurring in Mindanao and other islands to the south, so I planned a journey to the northern part of Luzon. I wanted also to see the many wild peoples who lived in this region, the Benguets, the Bontocs, the Kalingas, and the Ifugaos. They differed in dress, cus-

toms, and laws, but all were very picturesque, although some were inclined to be warlike, and addicted to headhunting. Traveling as a government official on government-made trails, however, I felt that the journey would be reasonably safe. Moreover, I wanted to examine further the suitability of the mountain streams for the cultivation of fisheries and to observe strange plants and animals that might be there.

I journeyed to Baguio with my old friend, H. Otley Beyer, an ethnologist and anthropologist from the University of the Philippines and advisor to the governor General on the wild people of the islands. Beyer knew the wild people very well and spoke a variety of their languages. We met an Ifugao chief and a party of his followers and Beyer showed them the wonders of the small city of Baguio. Electric lights were hard to explain, but he told them the electricity was like lightning, perhaps very young lightning, made to run on wires. When they visited the ice plant and the old chief saw large, recently-frozen cakes of ice, he was very surprised to find it was like cold, wet glass. There is no word in the Ifugao language for ice, because surface ice never forms there; but they do have much hail and, of course, a word for it. Beyer thus told the chief it was "hail." The old chief, as well as his followers, became excited and they all wanted to leave the ice plant, a place where hailstones might weigh fifty pounds! The normal hailstones that fell in Ifugao were bad enough.

We visited the dog market and saw perhaps a hundred dogs awaiting purchasers—not to become pets, but food. The wild people who come to Baguio—consider dog as satisfactory as pig, goat, lamb, or carabao; consequently dogs are raised for food just as pigs or lambs are raised here. I still prefer roast beef and doubt if dog meat will ever, under any conditions, make my mouth water. Dr. Beyer was unable to go farther north with me, so, after I found carriers for my baggage, we started through the mountainous regions of the Benguet Igorots.

A young Igorot whom I passed on the trail asked for a cigarette. He had been to school and spoke some English. "Baguio big city," he said. I agreed and asked if he knew about Manila. Yes, he knew Manila, "But, it not so big Baguio." I insisted that Manila was many times larger than Baguio. Then to make a good story, I said, "But in my country, New York is twenty times more big than Manila." This was too much for his credulity. "Sir, I think you do one big lie. Baguio more big." He was rooting for his home town.

We passed others on the paths, usually older men and women who would move off the path and conceal themselves in the undergrowth. As I rounded a bend in the trail I saw three naked girls, probably twelve years old, walking along arm-in-arm and singing, "Old John Brown had a little Indian, had a little pony." When

they discovered I was approaching, they ran to the side of the path and peeked through the bushes. As I passed them, they came out and asked for cigarettes, which I gave them.

We left Benguet toward evening and traveled to the government rest house, where I obtained a night's lodging; the following day we journeyed to Bontok, capital of the Bontok Province. The people there likewise are called the Bontoks. The country is completely mountainous and as a result their farms are strange. A series of walls are built around the mountainside, and the soil is loosened and placed against each wall. The separate fields may be several hundred feet long, from five to thirty feet wide, rarely more, and the retaining wall may be five to thirty feet high. Since it is necessary to irrigate these fields, almost all of the water on the cultivated mountains is used for irrigation. Wasteland that in most countries could not support a goat is thus turned into rich agricultural land. But there was no place for game fish.

Bontok was made up of a few government buildings and rather poor houses, and many extremely poor hovels—some were no more than cavities between small boulders covered over with hand-hewn boards and thatch. Most of the natives apparently did not care to adapt themselves to better housing. I doubt if I have ever seen more unsatisfactory living conditions in towns occupied by any of the pagan tribes, with the possible exception of those of the small black Negritos.

My collecting was not successful; I found only two or three species of lizards. One day as I was passing near a native house, I noticed a rooster that had just captured a snake. I was so desperate for specimens that I immediately started after the rooster. Finally, as he flew down the mountainside, he dropped the snake, which I appropriated. It must have been a very funny scene, for when I looked up I saw one of the Bontok Igorots bent double with laughter, and such laughter was rare among this people.

Then on into Ifugao country! Here I saw fewer people because most of the native travelers hid along the way until I passed. They were said to be the most warlike of all the northern tribes, except the Illongotes, and were feared by the neighboring tribes as well, because of their proclivity to headhunting.

I spent a night at Bunawe at the government rest house, and with my carriers started early the next morning to return south. I found no suitable streams for bass or trout, for most of the water was used for irrigation. The trip back could be dangerous; the constabulary had warned that the trail beyond Bunawe, back toward the lowlands, would pass close to an Illongot town where a number of individuals had lost their lives to the headhunters, a town whose reputation has not changed even to the present. A few years ago two American Fulbright professors were killed there, as well as a party including the wife of the former president of the Philippines.

I was carrying my .22 rifle, which usually afforded satisfactory protection. Late in the afternoon it began to rain; I took a rubber poncho from my pack, slipped it over my head, and covered the gun slung at my side, together with the sackfuls of live specimens. I had far outdistanced my carriers who had taken shelter under boulders during the downpour. Just about twilight, I was suddenly startled by the apparition of a young warrior leaping out from the grass beside the path. He was naked except for a G-string, brandished a long bolo, and carried a head-ax in his belt. Before the bolo descended, I jumped back and let out a terrific scream, hoping to frighten the warrior. At the same time I grasped the rifle, throwing the side of my poncho into his face. This confused him and he hesitated. I advanced toward him with my gun exposed and screamed again. This was effective, as he jumped from the path and disappeared through the forest toward the village. After it was all over, I found I was weak from fear, but I knew I must not stop on the mountain as he might regain courage and follow me in the dark. After recovering somewhat, I moved on, slipping and sliding down a dangerous path that had to be traversed before I would find a government rest house. The path zigzagged and I had to determine when to turn wholly by "feel" since it was a dark rainy night.

The rain had ceased, and since I had been walking for about three hours, I knew that I must be approaching the rest house. As I rounded a bend, however, I saw a startling sight ahead of me. Down the path two or three hundred yards, a mass of flame suddenly appeared out of the blackness and then slowly faded away almost completely. It was very eerie. I watched it for some time, during which it reappeared and disappeared several times; then I decided to move on. The fire disappeared from view as I went lower, but I found it again—a tree filled with fireflies lighting in unison. The tree of fire reminded me of the Biblical story of Moses and the burning bush that was not consumed. But coming out of my tree there was no voice such as the one Moses heard. Do such fireflies occur in the country where Moses traveled?

Fireflies are remarkable creatures since they produce cold light. Someday we may learn the secret of making cold light in quantities for practical use. I remember a cold light given off by the minute animals of the Sulu Sea, sufficient to guide my boat away from the dangerous coral reefs. And once, traveling in Mexico, I saw tiny glowing lights in the road, which turned out to be beetles, each having two small headlights. These lights were constant, not turned on and off as the firefly's. I captured five of these beetles and placed them in a small vial; on an open book in the darkness, they gave enough light to read by with ease—but back to my story.

I left the tree behind and finally found the government rest house after another mile of travel along the dark trail. The next day I

waited until early noon for my carriers to catch up, but I was in no hurry and needed the rest. The remainder of the journey was uneventful, and I returned to Baguio, in the Benguet country, then continued down the mountain by auto to the railway at Pangasinan, which returned me to Manila.

18. THE SOUTHERN PHILIPPINES

Some time later, through the office of the Governor General, I was given permission to join a coast and geodetic survey party setting out to work the southern coastline of Mindanao, which borders on the Celebean Sea. Preparations were made at once and my collecting materials were placed on board their vessel, which was to leave the following day. The captain was a very agreeable person interested in the type of work I proposed to do, and the other American officers were also friendly and welcomed me aboard. The journey to the south was wholly uneventful. We made short stops at Iloilo on the island of Panay and at Zamboanga on the coast of Mindanao, where fruits and vegetables were acquired. The captain also made an acquisition for himself, a handsome parakeet housed in a large cage made of slender bamboo slats.

We headed southeast and approached the coast of Cotabato Province, the sparsely inhabited area where the work was to begin. The boat was anchored some distance from shore in the vicinity of the tiny village of Saub. The crewmen could easily go ashore for surveying, or make soundings in the offshore waters. Each morning I was put ashore, and I usually spent the day in the forest, returning to the shore in the evening to be taken aboard the vessel.

On board ship, besides an ample stateroom, the captain had provided me with a small room below deck to use as a laboratory for the care and preservation of my collections. Here I prepared skins of mammals I had taken and preserved reptiles and amphibians in liquids.

One of our first survey areas was near a new plantation where an American planter was having the forest cleared for growing coconuts. At night, from the fallen trees, came the sound of a considerable variety of frogs calling. During the day, it was possible to obtain tree lizards and occasional tree snakes, as well as numerous mammals.

One day I returned to the ship with a live python about six feet in length. I decided to place it in a small empty cabinet in my stateroom, instead of keeping it in the laboratory with the preserved specimens. I told no one of the new passenger, not wanting to alarm my fellow travelers. But I sternly warned "John," my Chinese cabin-boy, never to open the cabinet. "OK, no open boss," he replied.

I wished to visit an inland area some distance from the coast and the American planter was kind enough to lend me a horse. One

evening I rode about two kilometers, dismounted, and started to investigate a series of recently fallen trees. I came upon a huge trunk still covered with a great many plants and lianas, and I heard the varied voices of frogs. I approached the trunk with my lantern to discern the calling frogs. I had captured two or three when I accidentally kicked against a shrub and made a noise. Almost immediately there was a loud shriek, followed by the sound of perhaps three animals spurting through the brush. After my heart returned to its normal position and my fright had subsided, I concluded the animals were deer—a stag and two does. Deer, and even horses, when badly frightened often utter loud cries which would seem to be foreign to either species. It took a good quarter of an hour to recover completely from my fright before I returned to catching frogs and lizards. A long while later I got my horse and went back to the planter's house.

The captain became interested in my work, but he was hesitant about believing some of my stories. I told him that certain arboreal snakes could be caught by letting a snake wrap its tail around a stick; then one might carry it an indefinite distance hanging from such a stick. This was too much for him to believe.

One Sunday I did not leave the ship until about one o'clock in the afternoon, whereupon the captain asked to accompany me, as he wished to learn some of my collecting techniques. I carried a handsome Malacca cane that he had given me. During the afternoon a number of lizards and one small snake were taken. Shortly after we had begun our return to the shore, I saw a tree viper lying sluggishly on a low branch of a shrub. I rubbed my cane on its tail and, as expected, it coiled its tail about the stick; I lifted the snake gently from its branch and walked down the path with a serpent swinging from my stick until we reached the shore. The captain then agreed that he would have to believe at least some of my stories.

I had also told him of a nearby colony of fruit bats that had many thousands of bats measuring nearly five feet in wingspread. This again strained his credulity, but after visiting this place, the captain himself thought there might be at least a hundred thousand bats.

I had discovered the great bat colony earlier, when I had seen them flying from their shoreside rookery in the nightly search for food in the distant mountains. The colony occupied a number of trees beneath which all plant life was destroyed by wild boar that visited nightly and prevented accumulation of bat guano.

The daytime behavior of the bats was fascinating. If I walked under a tree harboring perhaps a hundred or more bats, it did not frighten them. They remained undisturbed, hanging by their feet from the branches. Many fanned themselves with one of their wings and, if a female was caring for a young one clinging to her, she was almost certain to use a wing to fan herself at least during the hottest

part of the day. When they flew off in the evening they formed a long horizontal column, and as they crossed a river they would dip down and, presumably, get a drink of water. Then on to the mountains to search for fruits. What seemed remarkable to me was that these great colonies were composed of two species belonging to two genera, *Acerodon* and *Pteropus*, living together seemingly in reasonable accord. The largest, *Acerodon*, measured 5 feet 4 inches in wingspread; the *Pteropus*, about 4 feet 10 inches. The species were not segregated, and one species might alternate with the other along the same branch. A series of each of these two species was taken.

But some of the most interesting specimens taken were known as *Cheiromeles torquatus*. In a partly hollow log I found several that seemingly could not fly. They were nearly naked, their wings relatively small, but they had very well-developed breast muscles. Under the wings of females was a large pocket of skin covering the mammal on each side. This was for carrying young, since the lack of thick fur made it impossible for young to cling to the mother's fur, as is the case in most bats. These particular bats have a gland on the throat producing an extremely offensive odor. In females the gland has a single large opening; in males there are several small openings. It appeared that the bats I found had been injured when their tree dwelling fell, which accounted for their being unable to fly.

The coastline, as stated, had practically no native inhabitants. Occasionally, however, individuals were seen moving up or down the coast. One day a native hunter carrying a medium-sized wild boar that he had speared came along as we were about to go ashore. We thought we might purchase the fresh pork.

One of the workmen on the boat could understand a little of his language, and found that our hunter was interested in becoming a "Molo," a Mohammedan (he had the Oriental habit of changing the letter *r* to *l* for easier pronunciation). The man looked every inch the typical "wild man." He wore only a G-string and, besides his game, carried only a spear. His hair was long and matted, and he had several earrings in the lobes and rims of his ears. It seemed his idea of being a Moro was wearing a shirt and a pair of trousers. Some of the Filipinos from the boat took him in hand, and after he had removed a few layers of his surface sand by bathing, they cut off his locks, removed the numerous rings from his ears, and brought from the boat an old T-shirt and a pair of old trousers, which he donned. Now he was "every inch" a Moro. Later he went on his way, seemingly quite happy with his new nationality and still in possession of his pork, apparently unaware that it was forbidden to Moros!

Days later I startled a group of people who were just emerging from the forest to come down to the sea to obtain salt, fish, and other sea food. These people wore only the scantiest clothing, the women

were "topless" and carried babies. I quieted their fears by giving them some of my food and later I got pictures of the group as they sat on the beach and then fished with their hands in the shallow water. They had nothing so up-to-date as fishhooks.

It was at practically this point on the Cotobato coast that the Filipino government later announced discovery of a new tribe that lacked all knowledge of the uses of tobacco. This was in 1970, and two years later a previously unknown group of cave dwellers living in the same general region was reported.

The life with the surveyors was pleasant. As I said, the captain, in looking out for my comfort, had assigned me a cabin and a young Chinese boy named "John." To awaken me for breakfast, John would carry the ship's portable phonograph to a chair by my door and play a record of his own choosing—the "Méditation" from Massenet's *Thais*.

Late one afternoon while I was ashore, a rainstorm came up quickly and the constant rumble of distant thunder sounded like waves breaking on a headland at high tide. I started toward the shore but became confused and actually headed in the opposite direction. After a short distance I stumbled on a nest of a jungle fowl and appropriated several seemingly unincubated eggs. Suddenly I became aware that it was much later than I supposed, and that I should have reached the shore long before. I must be lost. Having had other experiences of losing my way in the forest, I knew enough to stay where I was. I prepared to spend the night and at once began cutting and piling brush and branches to form a bed on the wet ground. On this I piled quantities of small twigs and leaves of large plants. To protect myself from the numerous mosquitoes, I readied a large collecting bag to put over my head and smaller ones to encase my hands. I started a fire with my tiny emergency bottle of gasoline and boiled eggs in a bamboo cup. Thus, with some crumbs left from lunch, I provided myself with an evening meal. Covered with the small mass of branches and leaves, I was able to keep warm and to dry out while I slept.

Sometime during the night I was awakened by a group of wild boar passing, and found that the clouds were gone and the moon had risen. I discovered that I had been traveling away from the coast, so I marked my direction for the morning and returned to sleep. Shortly after daybreak I arose and started. I soon began to find evidence, in overturned logs and blazed places on trees, that I had been this way before. I reached the beach and signaled the lookout on the boat, who sent the launch ashore for me. I would arrive in time for breakfast.

On board they had been somewhat worried at my failure to reach the boat the previous evening. They realized, as did I, how futile it would have been to send a searching party ashore at night. And

getting lost is a risk anyone who insists on exploring the jungle takes. One officer had dismissed the matter by saying, "Don't worry, with his experience, he can take care of himself."

When I got to my cabin, my first concern was the python, and upon opening the cabinet, I found the snake gone. I called John the cabin boy, and after looking at his bland smile for some moments, I pointed to the cabinet and said, "You open?"

He replied, "No open, boss."

I tried again. "You no see anything?" His reply, "No open," was completely unconvincing. I dismissed him. I could imagine the excitement if the snake should turn up unexpectedly in some officer's cabin. Of course, it was possible that the snake had actually left the ship and taken to the water, since these creatures are wonderful swimmers. No incident was mentioned at breakfast, so I decided to say nothing about the escape of the snake. It is one of my besetting faults that I am always hoping for the best.

I spent the rest of the morning preserving the specimens collected on the previous day. In the afternoon I went ashore to visit a small sea cave from which I had seen tiny bats flying. The cave was in a cliff of limestone and the opening was rather narrow, but as one progressed a few yards, the cave became considerably larger. I carried a lighted lantern, not that it was especially dark, but I wished to locate the spot on the dome of the cave from which the bats might be hanging. I finally found a small group hanging upside-down on the ceiling and shot at them. Several fell and I ran to pick them up. As I did so, stones began to fall and as I hurriedly retreated, practically the whole ceiling let loose, and masses of rock fell to the floor. I managed to escape, having been struck only by some tiny pieces. The vibrations set up by firing the gun in the small cave had loosened the rock, and I had almost been buried. I felt lucky that there had been the short time lag between the shot and the avalanche.

I had gotten seven specimens before I escaped. These bats were very much smaller than the large fruit bats I had taken before. Those "flying foxes" had measured more than five feet from wing-tip to wing-tip; these tiny bats, only a few inches. In the front of their heads was a triangular depression, the use of which I could not determine.

That evening, the surveying work in this area being finished, the boat moved on down the coast and anchored near the mouth of the Gulf of Davao, much closer to shore than we had been previously. We worked in this area for another week, making daily landings. I knew that the survey work was nearing completion and that we would soon be heading back to Manila, but I felt that the journey had been a success.

At the officer's table, I found occasion to discuss pythons, re-

marking on the swimming ability of the creatures. And I told the classic story of one that had managed to swim eighteen miles to reach Krakatoa from Sumatra after the destruction of all life on the island by a volcanic eruption.

The weather had been extremely hot for the past week and I had been sleeping on one of the cots John had placed on deck. One morning I was awakened about daybreak by the night watchman, who was shaking my arm.

"Big sawa catch bird, captain bird."

"What!" I exclaimed, sitting up. Then the awful meaning of what he had said became evident. The "big sawa" was my python, and the "captain bird" was the brilliantly-colored parakeet from Zamboanga, to which the captain was teaching English. That is, the bird could say "eck eck," very plainly, when the captain said "Good Morning!"

Still in pajamas, I followed the watchman up to the captain's deck. There in the bamboo cage was my python, his head and neck thrust between the bars of the cage, trying to escape; but a suspicious bulge within his body at stomach level was too large to go between the bars. Here was the thief actually caught by his crime, even if the crime was only an early breakfast; his guilt was written on his body, if not on his face. I dispatched the snake at once without sentiment, preserved him, and removed the bird. This I washed and made into a museum birdskin, which, at this moment, is in the collection at the University of Kansas.

The presence of the snake on the ship was much discussed. The officers, in pondering how it had gotten aboard, recalled that the snakes were excellent swimmers, and the final solution was that the snake had climbed the anchor chain. Only John and I knew the real truth. When I went to the cabin I called John over and asked, "You open?"

"No boss; no open."

"You find open, then maybe shut?"

"No find open, no shut!!"

It was obvious that the snake had picked the latch from the inside and closed the door when he left.

Before our work was finished in the Gulf of Davao, I asked the captain to group some lights over the gangplank that was fastened to the side of the ship, and which allowed one to come abroad from the lifeboats or the small yacht. At night, the strong light shining in the water attracted an incredible variety of animals, chiefly fish and invertebrates. It looked as if the surface of the sea were paved for walking! I caught as many as possible, using a butterfly net as a dip net. There were many flying fish, and I took about thirty with the net, mostly above water in the air. Some actually came high enough to land on the deck. The most unbelievable objects taken

were the larvae of certain eels. These animals were perhaps eighteen inches in length, less than a dime in diameter, and seemingly completely transparent. For the benefit of an audience of officers, three were placed in a white wash bowl filled with clear water. Against this white background, all that could be seen were three pairs of black eyes moving through the water; not even an outline of the eels could be discerned in the clear water! These animals approached the impossible more than anything I have ever seen in my travels.

I do not know whether using the same technique elsewhere in the sea would result in such a congregating of sea life. The Davao Gulf is deep and near the edge of the great ocean chasm known as the Philippine Deep, with a depth of nearly five miles. Many of the small fishes taken were preserved, as were a few invertebrates. The flying fish found a welcome spot in the breakfast frying pan.

When we made the return journey to Manila, our ship stopped at Zamboanga and I sought everywhere for a parakeet, but found none for sale. I did see the captain again some twenty years later in Washington, D.C., in a restaurant. I happened to be walking along Constitution Avenue and from the sidewalk I noted a cafe below street level. Through the window I saw a gentleman in a Coast and Geodetic uniform and decided this was the place I would eat my dinner. I had scarcely been seated by the head waiter when a touch on my shoulder announced the arrival of the uniform—and the captain. He joined me and we began reminiscing. The python story was recalled, and I still maintained that the snake is a marvelous swimmer.

19. CHOLERA AND A TYPHOON

In thinking back over my adventures in the Philippines, one shipboard journey stands out clearly in my mind, largely because of two dangers that threatened for a time. One was the dreaded cholera, and the other was a typhoon, which almost engulfed our poor old ship. That neither of these dangers overtook us is evident; and the journey was a "bust" as a collecting trip.

The island of Mindoro, some ninety miles in length, lay southwest of Luzon and Manila and was near the regular shipping lanes to the south. A mountain range formed the north-south backbone of the island. And Mt. Halcon, in the north, which rose from near sea level to a height of nearly 10,000 feet, was one of the majestic peaks of the islands. Nearly everywhere was splendid forest, and close to the shore one saw narrow beaches of white coral sand. There were a few Filipino towns, and deep in the interior and in areas where the mountains approached the sea, there were the scattered indigenous inhabitants, a very primitive people of dwarf Mongol stock. They were apparently peaceful and would trade forest products for rice.

In times long past, Chinese traders and miners had come to the island and had obtained much gold. Thus, they called the island by a Chinese word meaning gold mine. The island did not acquire its present name until the Spaniards came and called it Mindoro, meaning a mine of gold, which was said to be a translation into Spanish of the Chinese name. Most of the settlements made by the Chinese had been wiped out, presumably by the mosquitoes that carried a malarial disease called blackwater fever. The mines had long been forgotten or lost.

Centuries later the Spaniards and the Filipinos had tried to settle the island, but they, too, for the most part died or left, and only a few small settlements remained, scattered at distant intervals on the coast. Apparently they did not discover the source of the Chinese gold. The wild natives, seemingly immune to the fevers, were the only ones who continued to persist in spite of all who would take the land.

When the Americans took over the Philippines, they made some attempt to settle in the uninhabited parts. They knew about fevers and mosquitoes, so they made clearings and destroyed mosquitoes. One such plantation for coconuts was begun at Sumagui on the east coast of Mindoro by an American family who had purchased land from the government and had lured Filipino woodsmen to help clear the land. Many of the trees were of hardwood and had a good market value in the sawmills of Manila. The trees were cut into logs, dragged to the open coast, loaded on boats from the water, and taken to the market in Manila.

My ill-fated adventure started with a journey to Sumagui for just such a boatload of logs. My friend Clark Burks, the son-in-law of Sumagui's owner, had chartered a boat in Manila for the trip, and he invited me to accompany him. Our vessel was an old sailing ship in which an auxiliary engine had been installed, and the captain of the boat was Spanish. The ship got clearance from the port authorities, and we left late at night. By morning we were outside Manila Bay; but the weather was unsettled and the barometer was slightly below normal "fair weather." The ship did not have a radio, so we could get no weather information that the barometer did not give; but, with that tub of a boat, a storm was the last thing we wanted to experience.

We ate a hasty breakfast and went on deck. We passed through two small squalls, accompanied by some rain, but the strong winds had been momentary. The barometer, however, was falling. Clark and I spent part of the morning reading old magazines, but I kept thinking about the weather. Later in the morning one of the crew casually mentioned that a man in the galley was ill. I went again to look at the barometer and found that it continued to fall. It began to look as if we might be in for a heavy blow in the afternoon,

whereupon Clark pointed out that there was no real shelter for a boat anywhere on the east coast of Mindoro.

Then, worse luck, another man from the galley came to the captain's bridge and reported that he thought the sick man was dying. The captain hurried below and remained there for some minutes; when he returned he said the man was dead and asked me if I would look at him. I did; it took little to surmise the cause of death. The terribly sunken eyes and the blackened areas below the fingernails as well as other, more unpleasant symptoms revealed that Asiatic cholera had struck. I told the captain it could only be cholera that had killed the man and pointed out the danger to the rest aboard. The man had been the second cook and had quite possibly contaminated the food. I urged the captain to try to disinfect the whole galley with boiling water, and dispose of all food with which the man might have come in contact. This he attempted with our help.

The captain found some heavy pieces of iron and attached them to the dead man. He was then wrapped in straw matting and was consigned to the sea for burial. Those who had touched the corpse were advised to disinfect their hands with alcohol I furnished, and change their clothing.

By now the captain was also watching the barometer, and it was still falling. Soon Clark pointed out Sumagui plantation ahead on the coast, and we would discern a group of small dugouts toying logs that were being rafted from the shore onto the water where the boat could anchor. It is a curiosity of hardwood logs that many are so dense that they are heavier than water and will sink, unlike most wood which is lighter than water and floats. In such cases, each log had to have a special raft of several bamboo poles tied to support it on the surface.

The work of pulling the logs from the water with a crane and winch was not difficult, but a great bank of clouds threatened the blow that was soon to come. Most of the logs had been put on the ship when the wind struck. It would have been folly for the men to try to row back to shore a half-mile away in their dugouts, so after their canoes were tied to each other, the work crew were gathered on our boat, and the ship started south. The captain pointed out on his chart a small island some fifteen miles south lying close to the shore, which, if the water were deep enough, might permit a ship the size of ours to find shelter. At the same time there was a chance of being wrecked upon the rocks opposite the island.

The boat pitched drunkenly. Raising her bow, she would smack the waves with her stern, then roll. Many of the men became sick, but it was difficult to know whether they were victims of cholera or of seasickness. Clark and I were afraid to eat. At last, sometime before dark, we were able to make out the tiny island, only two

hundred yards long, and the boat was headed toward shore. The sounding was made as we went in, and the ship narrowly escaped being caught on a headland. Finally we found comparatively quiet water, but still the ship tossed. The captain ran a line from the ship to the island and another line was fastened to rocks on the shore. Our situation was nonetheless precarious. The high cliff rising from the shore was at the moment protecting us from the wind coming from the west, but we knew there would be little protection when the wind changed and came from the opposite direction.

In a typhoon the storm is moving in one direction and, at the same time, it is whirling like a gigantic cyclone. In the center of the storm is an area of calm and if one were in the exact center there would be a small area of almost complete calm.

The storm continued. The food supply was being depleted, as the crew of workmen had left their own food on shore at Sumagui. After we found shelter I went into the galley and cooked a small pot of rice, seeing that the plates were placed in boiling water and that nothing touched the cooked rice. Next morning we contacted some natives on the shore and had them bring bananas and rice, which we obtained by barter. The workmen proposed to return to Sumagui by land, by following the coastline, and were put ashore with some of the food supplies from the ship. The storm had continued during the night, but we fortunately escaped the worst of the blow, and we had rougher going after the wind changed. The seas still were running very high and the captain said it would tear the ship to pieces if we attempted to leave. Clark and I cooked our own food and then we went ashore. Storm or no storm I was in hunting territory. Away from the shore I was impressed by many handsome, gloriously-colored shells of large tree snails that had been dislodged and thrown to the ground by the storm; several hundred were collected. On the face of the cliff at some elevation was a cave. It was not an easy access, but apparently the cave had been explored by someone before us, for against the cliff were notched bamboo stalks which served as ladders. I ascended with difficulty and gained the cave. The room was not large but it was being used by flocks of bats and the floor was covered with guano.

Two things were evident—that the previous explorers had been digging here, and that the cave had at one time served as an ancient burial place. The diggers had left bones and numerous pieces of broken pottery, pottery that in some century past had been imported from China and had been acquired perhaps in exchange for gold. One wonders why a primitive people should have acquired and appreciated these fine potteries, but the larger vases and porcelain jars were used to bury their dead and had survived the centuries only because they had been buried. Many had been broken, some probably because the diggers had been stupidly careless. A number

of human remains lying about suggested that many of the large vases had been found intact and had been emptied of their contents. It was obvious that burial in these jars had involved cutting up the body in pieces; sometimes it was even necessary to split the skull.

We were not concerned with the dead, but I did collect some bats. On the coast I found no amphibians or reptiles; apparently the storm had caused them to take cover. It was not often that I failed so completely to find specimens for the herpetological collection.

We returned to the ship, but the waves outside still were running so high that the captain decided to wait until the following morning before starting north. We hoped to get the remaining logs, if any could be found, and Clark expected to visit the plantation before leaving with the cargo for Manila.

But when we arrived at Sumagui there were no logs, and a lone man in a boat rowed out with sorry news. The workmen who had started up coast had been seized with cholera; they had been able to reach a small settlement where most had died. Only one man, who had gone ahead of the others, had reached the plantation, but he did not know the fate of his fellow workmen. Word of their deaths arrived later.

The ship had to return to Manila. This should have involved a stop at a quarantine station at Olongopo, on Luzon Island, where we should have observed a ten-day quarantine. On arrival the captain reported the death; but that the man had died of cholera was not reported, since there had been no doctor aboard who could have stated positively the cause of death. Clark and I certainly had no desire to remain exposed for ten more days to the possibility of acquiring cholera on board the vessel, so we compounded a felony perhaps by remaining silent. We only knew that the man had died by natural causes and had been buried at sea. No further illness had developed on board. After two days the boat proceeded to Manila, where the ship's owners were told of the happenings and the ship was thoroughly fumigated.

20. THE GRAVEYARD ON TABLAS

Back in Manila, the large aquarium that had become my concern needed attention. There were some sixty aquaria for fish, as already mentioned, and three other exhibits; one with two large sea turtles, another with two half-grown crocodiles, and still another containing three large pythons between fifteen and twenty feet in length. Since the inhabitants of the aquaria were replenished twice a year, I sent men to collect live fishes at Naujan, a port on Mindoro, where I planned to join them a week or two later. A small coast-guard boat would be sent down to Naujan with pumps and tanks so that the live fish might be delivered to the aquarium in good condition.

It was very interesting fishing with dip nets around the edges of

coral reefs at low tide. One always had to be on the lookout for the purplish "foot" of the large angel-wing molluscs. When stepped on, these molluscs are able to close the bivalves and trap a careless fisherman, and without help he might be retained and drowned at high tide. Men so caught need an iron bar to break the shell.

I returned to Manila with a collection and proceeded at once to provide the newcomers with their respective aquaria. Some of the tanks contained a variety of fish, but it was necessary to keep fishes of nearly the same size together or the larger ones would eat the smaller ones. Often, too, one fish would be more pugnacious than another and fighting ensued. It was necessary to watch them carefully, or fish would be found with fins bitten off or with injured tails. Frequently fishes that I had never seen before were brought in and I used to place these in small individual aquaria until I learned their habits.

One specimen, a very strongly compressed fish having only a tiny mouth, was received in one lot, and I was certain it would do no injury to other fish and so placed it in an aquarium with about thirty others. For nearly a week all went well, but one morning my helper reported that many fish were dead. I found all the fish in one of the tanks dead except one, my new one. I at once suspected that the air had been shut off, leaving the water with insufficient oxygen, and the fish had smothered. But there was nothing wrong with the air circulation. Next I suspected that one of the workmen had poisoned the water by accidentally allowing a cigarette to fall in the tank, but this had not happened.

Then I began to suspect the sole survivor. Why should this one survive and the others die? I cleared the tank, renewed the water, and returned my suspected villain to it, along with a few other fish. Several days later all the fish were dead except the suspected one. No, no longer suspect; its guilt was a certainty in my mind now and so I, as judge and jailor, condemned the fish to live the rest of its life in solitary confinement in a small tank. The fish seemingly had a skin poison, but just how this was exuded and how it entered the body of the other fishes I did not know, although my suspicion was that it must have been absorbed through the gills. Unfortunately, the species was never identified.

On some of my southern journeys I had passed an island called Tablas, which means "table." It was about eighteen miles long and up to six miles wide. It had been cultivated, most of the forest cover having been removed, and many of the hills in the central-southern part were grass-covered and supported numerous cattle. I thought it would be interesting to see whether the forest animals had disappeared when forests were removed or whether they had adapted to the farming country.

I decided to visit Tablas and to learn its history. About three

hundred years earlier the island had been inhabited by a tribe of small, primitive Mongols, who were reportedly warlike. When the Portuguese, the Spaniards, or the Filipinos came to take the land, the Mongols fought, but lost. The last survivors, some two hundred individuals, had been transported to Mindoro, which was then regarded a very undesirable place to live. Enroute to the island the boat and all passengers sank in the sea. Some of the Filipinos living on Tablas were convinced that the boat had been purposely sunk to get rid of these people, but I doubt this is true.

I took passage on a small interisland steamer, and, thinking that I would have no use for my own boat, left it behind. The steamer was scheduled to make the regular stop at Odiongan, the port and capital of Tablas, and presumably would come back in two weeks, at which time I planned to return to Manila. I made my headquarters at Odiongan. Here there were no wild, unfriendly people.

I had brought traps to collect mammals, as well as my usual outfit for preserving specimens of fish, reptiles, and amphibians. And at the request of an entomologist, I was to catch some butterflies.

On my second day's trip to the country, I found a small depression partially filled with water on the side of a hill where some limestone had been removed. From a point above it, I noted a large lizard apparently drinking from the pool. I made a detour and crawled close to the edge of the depression to look down. Sure enough there was a huge lizard nearly four feet long eating a frog that had been killed. I wanted the lizard for my collection, but I had no gun or stick, only a butterfly net. The reptile suddenly reared its head, saw me, and started to clamber up the side of the depression. It would certainly escape. Seizing the fragile butterfly net, I swung it over the reptile's head and slowed him down until I could get up from my horizontal position. His clawed feet ripped a great gash in the net, and his head tore a hole, too. But now I had my hands on the creature and soon had him in a stout sack. By this time the fragile butterfly net was in shreds.

The next day I traveled to a sparsely-inhabited part of the island where the natives told me there were ghosts and spirits; many were afraid to visit the region. I followed the seashore for some miles before the sun became too warm. Rounding a small headland, I came upon a curious scar on the low cliff where a huge mass of surface had seemingly slid into the sea, perhaps as a result of an earthquake. It was obvious that the missing rock was actually the covering of the cave, and one that had been the burial place of the primitive Mongols.

The floor of the former cave, completely exposed, was about thirty feet wide by forty long. The floor was strewn with broken pottery jars, vases, large celadon plates, and other vessels. Scattered everywhere were human bones. There was not a single piece of the



FIG. 2.—E. H. Taylor, about 1922-23, in the Philippines. Photo courtesy of Kraig Adler.

pottery that was not broken. If the pieces had been in perfect condition, they would have been of considerable value because they were of the type that had been brought to the islands from China in pre-Spanish times, perhaps more than 500 years earlier.

I collected several skulls, representative of what I believed to be both men and women. I noted one very curious thing—a gekko lizard emerged from the base of one skull. On looking into the skull, I found that almost the entire brain cavity was filled with the shells of lizard eggs plastered on the skull walls and on other eggs. This was indeed a strange nursery for young lizards! Over on one side of the terrace I found the remains of a large jar. Under the toothless skull of an old man, I found a curious metal object covered by a thick deposit of verdigris. It was bronze or copper, which was remarkable because at that time the natives were not supposed to know metal work such as this. In a sack I placed several skulls and pieces of broken pottery, with the intention of taking them back to Manila. I took them back to the village at dark and carefully hid the sack outside of Odiongan. I acquired a box and, after nightfall, packed the skulls carefully together with the other spoils. I did not want anyone to know I was taking the skulls back to the Bureau of Science.

Our boat was due the next day about noon. I finished my packing and moved my baggage to the wharf, but the boat did not come that day. Next morning, bright and early, we were again waiting at the wharf. I did not dare attempt any collecting for fear the boat might arrive during my absence, but the whole day passed without a boat. Finally, after a third day, we concluded that our boat had been sent on another run and would not come again for another two weeks. It had happened before. However, we were able to avail ourselves of an alternative. We learned of a tiny sailing vessel that was preparing to leave for the city of Batangas on the coast of Luzon. From there, we found it was possible to go to Manila by train. The patron of the boat agreed to take three persons as passengers, and after another day's delay, we started back to Manila on our sailing boat.

Everything seemed auspicious. There was a good wind and we left Odiongan with all sails full; but toward evening the wind died down completely and our boat idled by a small group of tiny islets. Next morning there was still no wind. One of the sailors had, while moving my crates, permitted one to fall and it broke open enough to show the skulls. When the patron discovered this, he grew furious, convinced he had found the cause of our trouble. The skulls had becalmed the ship! He proposed to dump the box of skulls, but after a wordy battle with me, allowed the box to remain.

I had put the piece of metal found in the burial jar in my pocket, and while waiting for the wind to come up, I began to clean it, care-

fully removing the verdigris that had accumulated on both surfaces. It proved to be a small Portuguese religious medal, commonly worn around the neck on a chain. One side bore an engraving of a bust of Santa Caterina; the opposite side, the Latin inscription "Sanctissima Christo ora pro nobis."

What was this object doing in the burial jar of a dwarf Mongol? I got my answer later, in Manila, when I showed the object to the director of the Jesuit museum. He said the medal was one a Catholic army officer might wear and suggested that it might once have been the property of a Portuguese officer killed when the Portuguese had invaded the island two or three hundred years ago. This object probably had been taken from his body by a native who kept it as an *anting anting*, a charm, until his death.

We waited for the wind another day and night; but it was well into the afternoon of the next day before there was enough wind to fill the sails. All this time the patron kept insisting that I throw the skulls overboard, but I assured him they must be regarded as government property and throwing them away would be a crime.

Finally, we were on our way.

The next afternoon we were in Batangas Bay sailing along peacefully. On the trip I had worn a beautiful new velour hat which my wife had brought me from the United States. While I was sitting under the boat's awning, a gust of wind blew the hat off and plopped it into the sea. I yelled for the patron to turn the boat around, for at no cost could I lose that particular hat, but the patron, still feeling angry about the skulls, ignored my plea. I jumped overboard and recovered the hat, but the boat sailed on. I felt sure that if it did not return for me, I could swim to shore, less than a mile away. After making a wide turn of half a mile, the patron did pick me up. He had been angry about the skulls, but by now he was in a rage! So was I!

There was little I could say or do, and when I left the boat, I tried to smooth his anger by leaving some money for the extra distance I had caused him to travel. But I did not feel that either I or the skulls were responsible for the calm that had delayed our journey.

21. POLILLO

On July 9, 1920, I undertook a collecting trip to the island of Polillo, off the east coast of Luzon, and to Calocot, one of a group of small islets east of Polillo. My visit resulted in obtaining a considerable collection of herpetological specimens, a few of which are worthy of mention. I was able to recognize most of the species encountered as belonging to species of the Luzon mainland. In many cases, however, there were small differences in accord with their

points of origin. And of course a few specimens presumably represented new species.

Most of the island, which was a little less than twenty miles long and between three and ten miles wide, was forest-covered; but the undergrowth was not heavy enough to make walking difficult. A great many of the trees supported masses of orchids, and of large, elegant ferns, *Asplenium nidus*, the bird's nest, especially conspicuous because of their size and appearance. The fern develops on a limb, the fronds growing outward and upward, thus providing a basketlike cavity that collects dead leaves, twigs, dust, etc. With decay this material forms a soil that provides a terrestrial as well as an arboreal habitat for worms, insects, centipedes, and grubs. All this provides food for small lizards and frogs, and these, in turn, food for occasional snakes. The bulk of these plants becomes heavier and heavier after years of growth, and not infrequently their weight, often 50 and occasionally 100 pounds, will break the limb from the tree.

Cutting these huge plants to pieces in the trees was not a successful way of collecting, so, choosing ferns growing in trees near pools or small streams, I would cut or pry them loose, then carry or drag them to the water and submerge them. This drove the denizens to the surface of the water where they were easily captured and bagged.

A noteworthy find was a small green gecko hidden in the basal part of the fronds of one plant. This species was new to science and later was given the name *Gekko smaragdinus*, owing to its green coloration. Altogether twenty-two specimens were taken on the island, for the most part from a species of spiny-leaved *Pandanus* about 15 feet high, growing along the shore and small streams. These were cut and submerged and the specimens captured as they swam ashore. To my knowledge, the species has not been taken again in the past fifty years.

Another surprise was finding in a fern two specimens of a small snake, *Typhlops cummingi*, which had been discovered before 1845 in the Philippines and named by Gray of the British Museum. This small snake is terrestrial and one can scarcely believe it had the musculature necessary to permit it to climb a tree and reach a fern. Several specimens of a small skink were found, but the species did not appear to be limited to the fern habitat for I found one specimen in a *Pandanus*. This was named *Saiphos herrei* for Dr. Albert Herre, who succeeded me as Chief of the Fisheries when I resigned.

Two specimens of a very rare Philippine snake were found, *Haplonodon philippinensis* Griffin; and two others of another rare variety were seen but escaped from the ferns before I learned the proper technique for catching them. One specimen of *Hologerrhum philippinum* Günther, a terrestrial species, was taken. Three small frogs

of the genus *Philautus* were found (and all were regarded as new). And another small snake, *Hemibungarus mcclungi*, was discovered when I was crossing the island to the eastern coastal town of Bislian.

At Burdeos, a small village on the eastern coast of Polillo, I was told of a bird that lived on the island of Calotcot that dug holes in the ground and buried its eggs as a lizard might. I suspected that I was hearing a local myth, not knowing very much about ornithology, but I was curious and decided to visit Calotcot.

I found a group with two dugout canoes that had arrived from Calotcot to bury a child in the Bislian graveyard. They agreed to take me to the island and bring me back when I wished to return.

We departed late in the evening. I occupied one end of the dugout and soon was asleep. During the night we ran into a tiderip and a heavy splash of water awakened me. At first I was sure I was in the sea; it was soon apparent that the boat was intact, but that I and my equipment were awash. We bailed out the water and continued on our way, arriving sometime before morning and catching a bit more sleep at my boatman's house.

After a breakfast of rice and instant coffee, I began my search for the bird, as well as for the desired amphibians and reptiles. A few hundred yards from the house I found the bird's nest, which was a somewhat circular mound of earth three to four feet in height and twelve to fourteen feet in diameter. It was a communal nest, the product of the efforts of generations of birds over a long period. The boy who accompanied me looked over the surface, began to dig, and shortly presented me with a great egg, as large as a goose egg. My "myth" vanished into thin air in the face of this absolute evidence. The boy pointed to a place for me to dig and at a depth of about two feet I, too, discovered a similar egg.

It was not until two days later that I was fortunate enough to see the bird that so buried its eggs. The birds were very much smaller than those usually capable of producing such an egg—which I would guess was equivalent to one-third of the total weight of the bird. I later learned that the bird was a species of megapode or mound-builder, and its habits had long been known.

The behavior of a group of snakes next attracted my interest. The recent settlers on the island had been clearing the forest and preparing the land for cultivation. Along the edges of the forest adjacent to the cleared areas I saw several snakes attempting to catch lizards. The snakes seemed nearly famished. The lizards, foraging on the ground, could outrun the snakes and escape up a tree. During the period of an hour I may well have seen twenty such chases. I caught specimens of each; but if a frog or lizard were held in my hand, a snake would attempt to take it from me. The lizards were small species of *Mabouia*; the snakes were of the species *Natrix*. Apparently the destruction of part of the forest had upset the normal

balance of nature by taking away the snakes' usual source of animals for food, and they were attempting perhaps to obtain a food source in another species.

The following day I returned to Polillo. About August 12 or 13, I left Polillo by the same interisland steamer on which I arrived. It took me to Hondagua, where I entrained for Manila. Back again in Manila with my treasures, I looked forward to a much-needed rest.

In 1920 my wife Hazel and I returned to the United States for a vacation, but we were uncertain as to whether we would return to Manila. Considerable pressure was being exerted on us to remain permanently in the States. Thus, it was decided that I would resign, take my accumulated leave pay, and a bonus. But I hoped to return.

We were with the family of Mrs. Taylor in Kansas City; and compared to Manila, life in Kansas City, which included commuting to the University of Kansas, seemed prosaic. Hazel and I agreed that we would go back to Manila. We were able to occupy our former house near the Bureau of Science, and I was offered a position as head of the zoology department in the university. Most of my journeys, financed by me, were to places on Luzon, Cebu, even Mindanao—but none to the old Manobo "homestead." I suspected that I had found most of the herpetological novelties in that area.

II

EDWARD HARRISON TAYLOR: THE TEACHER

BY

A. BYRON LEONARD

“First question: Trace the evolution of the human hand from fish to man.” Forty-seven pencils flew over the lines in as many blue books, for the students in Zoology 3, Comparative Anatomy, many of whom were sophomores visibly trying to control the trembling of their upper lips upon which a nascent down was emerging, knew that there would be no repetition of the question. The question or exercise was dictated in a firm, almost stern voice that enunciated each word with ringing clarity and studied emphasis. Ed Taylor took no chances with examination questions “escaping” from some secretary’s desk; besides, in those days the Department of Zoology had only one, part-time secretary! The examination questions were dictated as they were composed, on the spot. When what Ed judged to have been sufficient time for writing had elapsed, he dictated the next question, but he sometimes conceded a little time at the end of the hour for students to go back over their blue books and fill in any gaps they had left. The crisply conducted examinations, that left little opportunity for cribbing, epitomized Ed’s philosophy of maintaining in the classroom a strictly businesslike relation between himself and his students. A self-disciplined man, he believed in strict discipline in the classroom. Since he invariably came to class appropriately dressed, including suit jacket and necktie, his students instinctively presented themselves in neat attire and with well-brushed hair. This was the early thirties of which I speak; I often wonder how Ed would have reacted to sophomore premedics dressed with the studied disorder, and with the matted hair and scraggly beards that much later came to be the mode among students.

Ed was a superb teacher of undergraduates; he always came to class well prepared, his lectures were invariably well organized and his talent at the chalkboard was remarkable. He entertained questions from the students, and to those who found courage to ask them, he gave serious, well-conceived answers, even when the questions betrayed the profound ignorance of the questioner. He viewed comparative anatomy not as a study filled with Latin names of muscles and bones and nerves to be memorized—he confidently assumed this would be done as a matter of course—but as a philosophy of vertebrate biology. His bible and foundation stone for the study of vertebrate morphology was Harris Hawthorne Wilder’s “History of

the Human Body," a book which unfortunately has long since disappeared from vendors' shelves, although a battered copy remains a treasure on my desk. Founded on a sound knowledge of vertebrate development and anatomy, Wilder proceeded to discuss the principles of vertebrate adaptation that have led to the evolution of the human body. Following Wilder, Ed took as the cornerstone of his philosophy a strong conviction that life is and always has been since its inception in some ancient sea, a continuum; that the soma is ephemeral but the germplasm immortal, and that by minute, inexorable modifications in response to the impact of an everchanging environment, man has evolved from humble and apparently simple bits of protoplasm through an orderly series of events, the vestiges of which remain in the living classes of vertebrates. Taylor was not afraid to be an advocacy teacher; to him organic evolution was the key to the biological world, and those who could not for various reasons accept this, and there were then a considerable number of this persuasion, he could not understand. Nor could he accept them.

Anatomical drawings as a discipline in themselves, and as an aid to observation formed another significant part of Ed's concept of good teaching. He could look at a drawing and its labels, and in a moment assess the powers of observation of the student. Adept at scientific illustration, his criticisms of a drawing were worth listening to. He depended upon his teaching assistants—and I had the good fortune to be one of these for several years—to carry the load of detailed instruction in the laboratory. He expected us to be well-prepared, and usually we were. But he maintained a close contact with the laboratory, wandering from table to table, from student to student, admonishing here, encouraging there. The respect and even awe with which he was held by most students in his laboratories made the assistants' task much easier, and indeed a pleasure, although we had to maintain a sharp facility with the dissecting probe, and a rabbinical familiarity with the dissecting manual. This laboratory manual of comparative anatomy, the only one available for many years, was, strangely enough, written by a distinguished *invertebrate* zoologist, Professor Libbie Hyman. Ed was fond of relating with obvious pleasure an anecdote concerning how Miss Hyman came to write a laboratory manual of comparative vertebrate anatomy; it seems her bank account was low, and after examining the situation, a laboratory manual of comparative anatomy seemed to be the easiest and best way to bolster her financial situation. And it was a success, including the fortification of the bank account, I am sure. At any rate, Ed used this book, and it was more than a dissecting manual, for many years, until his retirement from teaching in fact.

One result of Ed's considerable talents as a teacher of undergraduates was his charismatic effect upon students, many of whom

returned at every commencement on a pilgrimage to revisit "Doctor Taylor," as he was always called. His personal magnetism, manifest long before it became fashionable to borrow a Greek word for it, drew his former students back to his office as a lodestone draws the compass needle. Many former students became famous physicians or businessmen, but they never outgrew, nor have they outgrown to this day, their habit of the pilgrimage to Ed Taylor's office, the one teacher who most profoundly affected their lives.

As a teacher, mentor and colleague of graduate students, Ed Taylor reached the peak of his talents as a teacher. Much less formal with postgraduate students than with undergraduates, he nevertheless knew how to maintain the subtle barrier that separates the teacher and the student even as it binds them together. I never heard a graduate student, even those with whom he had worked for closely for several years, call him by his first or any other familiar name, nor did I until years had passed since my doctorate. It was not that his graduate students did not develop a sincere affection for him; his stature as a scientist and teacher simply made familiarity of address seem grossly inappropriate.

How well I remember a course in mammalogy that I took from Ed. We used F. E. Beddard's old classic text book, which had its points, but Ed wanted to up-date for us the systematic categories, and this he did by dictating long lists of polysyllabic names and authors. I was then callow if not exactly youthful, having just graduated from a small college that had a department of biology that did nothing about such abstruse subjects as systematics. So I sweated profusely, along with a few others like me, trying to get those names correctly. Eventually someone, I think it must have been Claude Hibbard, with his characteristic zeal, dug up the sources Taylor was using; thereafter my lot improved in the course, and I could enjoy Taylor's fascinating accounts of mammals in the Philippines and elsewhere. He had a series of study skins of Philippine mammals that had suffered somewhat from travel half-way around the world, but each became the focal point of an intriguing account of how the animal lived and coped with its environment; the scaly pangolin came alive, and we could see the strange beast shake the ants from beneath its scales and devour them, the huge isolated vertebra of a whale put the smell of salt spray in all our nostrils as Ed wove his magic while we learned. This class introduced us to horizons even as it introduced us to a teacher steeped in his subject and eager and willing to communicate the wonders of the vertebrate world to those of us who felt ourselves his disciples in zoology.

Fascinating as Taylor was in his class in mammalogy, it was herpetology that was his forte; it was the creatures of this world that brought out all the traits of teacher and scientist with which Ed is so generously endowed. Like many youngsters I had been brought up



FIG. 3.—A field crew from the University of Kansas, about 1933, enroute to Mimeoapolis, Kansas, for an elephant skeleton for The University of Kansas Museum of Natural History. Right to left are Max Elias, Byron Leonard, Claude Hibbard, Edward Taylor, David Dunkle, Bob Perry. Photo courtesy of Kraig Adler.

to fear reptiles, especially snakes, and worse, had been taught that the only good snake was a dead one. Under the tutelage of Ed Taylor and his enthusiastic insight into the personalities of these, for the most part gentle, animals, an entire new world opened for me and for many others. Together with this academic introduction to herpetology came even more exciting field trips as spring approached. Attired in work clothes and boots, and carrying a gasoline lantern and other gear, we tramped the sloughs and ponds on "Haskell Bottoms" and other areas, searching for the first frogs of the season, and making, as far as we were concerned, new discoveries at every turn. Who has discovered his first clutch of frog's eggs, or seen the mating antics of a pair of snakes will know what I am trying to say. Ed was a man of tremendous strength, and slogging all night through the mud was no chore for him; while I and other students came back to Snow Hall dragging our tails, Ed was leading the pack, and eager to get the specimens "pickled" and labeled. Or, later in the season, we took off on expeditions to Washington Creek and environs, looking for snakes and lizards that gathered under stones as the sun warmed them a bit. Ed had an incredible way of knowing under which stones the animals were hiding; while I struggled to overturn a large stone, only to find no residents beneath it, Ed would turn over a similar one nearby and lo! there were several snakes and as many lizards. It was years before I grasped the subtleties of this skill, and never did I attain that of our teacher.

Best of all, we sometimes, by dint of saving our meager funds and preparing our food in advance, canned stews and the like, were able to take off on longer field trips, perhaps to the Flint Hills, or Cherokee County, where the Ozark Uplift enters Kansas for a few miles. The Museum of Natural History had a battered Chevy truck, and Ed had an equally battered car of what make I no longer remember; at any rate, we distributed ourselves in these crippled vehicles and took to the wilds of Kansas. Ed was a driving man, and we worked long hours, but every moment was filled with new bits of information, new techniques, and new concepts to digest. I even learned how to put a frightened and angry rattlesnake in a bag! If we had a bit of energy left after the day's collecting and the night's work in preparation of our specimens, we sat around the campfire and were regaled by Ed's accounts of other worlds and other times. Ed was a raconteur *par excellence*, and we learned as we were entertained, for his stories always had a point to them worth remembering. For all his talents as a teacher, Ed was no mechanic. I remember that on one of these extended field trips, Ed's car began to make a truly terrifying racket. It quite literally was clearly audible a mile away. I tried to get him to take it to a garage, but he postponed this until evening. I don't remember what the problem was, but I do remember that its repair cost less than a

dollar! All our worries went for naught, and Ed had none. He could not have cared less, as long as the wheels turned.

It would not be fair to mention a few without mentioning all the students Ed trained who have gone on to become noted in their respective fields in herpetology. Like the undergraduates who toiled in comparative anatomy, Ed's former students in herpetology remember with deep respect and fond affection, the talented teacher, relentless researcher, and loyal friend, who so profoundly affected both their lives and their concepts of the biological world.

III

THE BLAZING OF A TRAIL: THE SCIENTIFIC CAREER OF EDWARD HARRISON TAYLOR

By

HOBART M. SMITH

Man's brief tenure on Spaceship Earth has seen billions of his kind traverse the stage of life. Most have been a flicker of light, or a dark spot, perpetuated only in the minds and records of their own era, and soon forgotten in the unceasing procession of successors. A few, blessed by particularly benevolent heredity or circumstances, or both, have attained the stature of giants whose light, or shadow, is cast over many generations to follow. They established standards of achievement others emulate, or scrupulously avoid, for generations far in excess of their own.

Edward Harrison Taylor is one such giant, blazing a trail that will guide others as long as men continue to explore the mysteries of the diversity of life on earth.

A dangerous and perhaps even fatal tendency of lesser lights is to idolize and worship the giants of their time. Idolatry from the past is largely harmless, but the charisma of the living can be grossly misleading where wisdom is lacking. How tragic that wisdom is so often recognizable only in retrospect and that, in the present, charisma so often masquerades as wisdom! The two have little in common, yet are widely held as siblings in the public eye.

A political giant can draw upon charisma alone, or upon a happy combination of charisma and wisdom, never upon wisdom alone, in achieving stature. An intellectual giant draws largely upon wisdom, and for that reason merits twice the acclaim of his political equal, with two strings to his bow. Edward Harrison Taylor is an intellectual giant who achieved his stature, as have all others of his kind, through exercise of wisdom. Those of us who have known him in person, however, are the fortunate ones in his legion of beneficiaries, for we have not only experienced his intellectual stature, but with it the rarest of companion attributes among intellectuals: a magnetic charisma the equal of any that ever strode the land, chained by profession to academic circles. In other circumstances there are few heights he could not have achieved through free exercise of both of his extraordinary talents.

There is yet another, commonly overlooked attribute of doyen stature, especially of the intellectual type, and that is longevity of effort. Particularly is this a factor in areas of endeavor, such as

Taylor's, in which no major principles or relationships appear to remain to be discovered. Stature, then, becomes a product of prodigious effort over long periods, skillfully utilizing the best of the techniques available, and exposing voluminous new discoveries in uncharted territory or where others had overlooked them. Those who aspire to Taylor's record of achievement cannot falter in effort as time passes, or submit to early demise. The lesson provided is that adversity is no excuse for cessation of effort; the work must go on, it must remain a source of pleasure despite its familiarity through practice year after year, and wisdom must continue to grow. For age, reached through many years of unceasing mental activity, is an asset only as it is marked by progressively cumulative wisdom. In man, death comes, in effect, not just when life expires, but when mental growth ceases, and E. H. Taylor is a rare example of the unceasing growth of wisdom over many years, and of the monumental, unparalleled reservoir it constitutes, unique in content, never duplicatable, ours to be tapped as long as it remains intact. That reservoir, ephemeral though it be in the context of the history of civilization, is to be revered as much as the permanent etchings spun off by it.

But worship has long been forfeited by Taylor's choice of endeavor. In the world of science no quarter can be asked or received, and in this portrayal no attempt to distort realities can be condoned, nor would it be expected. Credit must be given where due, but the model is very human, and humans—even giants—have failings that keep them forever within the reach of their fellows, albeit only of those with the longest arms. Preserve us from a perfect human! However exceptional any person may be, a realistic perspective in the world of science must eschew deification. To deviate from these constraints would dishonor the integrity of the scientific eminence of the man here appraised.

For indeed integrity is, despite some opinions to the contrary, one of the most unassailably pervasive attributes, almost to a fault, of E. H. Taylor. A lie, deliberate misrepresentation, dishonesty, enrage him mightily, and woe betide the guilty one! He has, himself, always been scrupulously honest, both intellectually and materially, and would not condone deviation from his strict personal standards in anyone else. He does not hesitate to test the integrity of his associates from time to time, usually without their knowledge. Once when he had completed the manuscript keys for his epochal monograph of *Eumeces*, he asked me to test them with a small sample of specimens he supplied for the purpose. Unknown to me, he had changed the locality labels on selected specimens, so that a familiar *Eumeces fasciatus* carried a tag for a Chinese specimen, etc. I can safely say that my whole career unwittingly (to me) depended upon my response, for had I not admitted that the altered specimens would

not key out in accordance with locality labels, I would have been summarily booted, or worse. It was not an easy decision for me at the time, for accusing the Master of constructing faulty keys could have, I thought, serious repercussions. I could be grateful for the strict conditioning of childhood that did not yield at that time to the fear of recrimination upon truthful exposition of supposed error. I had yet to learn that Taylor never flinches in the face of constructive suggestions, whatever their source. Ego-trip criticism, however, arouses his fiery ire as effectively as dishonesty, for he clearly sees through its false pretenses and indirect dishonesty.

His strong distaste for self-inflating as opposed to constructive criticism has likely been responsible for his almost complete abstinence from writing reviews. His average is less than one every ten years over more than a half-century of prolific publication.

One of the most fascinating aspects to watch as the life history of an individual unfolds is his choler. Many individuals are mild-mannered and reasonable in their youth, but grow cantankerous and unreasonable in their old age. Others are just the reverse. One is an expression of failure, the other either of success or of good-humored resignation to or contentment with the goals actually reached, even though they may have been narrowed in scope or reduced in magnitude since they were originally erected. Taylor belongs to the progressively mellowing group, as befits a man who surely has attained most of the goals of his life. In his youth he possessed a fiery temper and flew into towering black rages that made students and colleagues alike cower in fear. Despite evidence to the contrary, he never to my knowledge has allowed his ire to lead him beyond the threat, to actual physical violence. Indeed, I have marvelled repeatedly at his extraordinary control of his emotions, shifting from suave cordiality to black moodiness, from hypnotic raconteurism to utter silence, from warm hospitality to cold rejection, in bewildering succession. In more advanced years he has become rather consistently affable, but he still retains the powers of a skilled showman as the occasion demands. Indeed, I regard him as perhaps the most complex personality I have ever known, largely unpredictable, never really intimate.

Never, for example, in the many years of my association with EHT, first as a student and ultimately as a colleague, did we wander far from professional matters in our conversation. We learned about each other's innermost thoughts by a comment here or there, individually scarcely noticeable but collectively quite revealing, although always fraught with the hazard of misinterpretation. Ed's impeccable standards of integrity stem no doubt from his strictly supervised childhood in a family of simple but strong faith in Christian ideals. He sometimes belittled his early training, and angrily denounced a parental supervision that nurtured character-

istics he regarded as weaknesses. Yet he maintained his basic standards throughout his life, although his quick and penetrating mind in the atmosphere of biological study led him to a naturalistic philosophy of life quite different from his early religious training. I am not aware that he ever entered a church, after parting with his wife, although he has had many friends among the clergy.

His reluctance to become closely familiar or confiding with anyone is a logical corollary of his complex personality. He has not wanted to be transparent as are many simpler folk, perhaps being cognizant of the probability that understanding is impossible, and that to attempt to achieve it would only confuse. Even now I doubt that any can say they fully understand him, however much they admire or view him with affection.

The complexity of personality is an adjunct of complexity of talent. Music, history and literature are broadly familiar to him, and at various times he has toyed with composition of both prose and poetry. He used to delight in singing, and played a bit on the piano. It was one of our most delightful pleasures, while graduate students at KU, to listen in as he skillfully argued in esoteric fields of scholarship with philosophers on the KU faculty, with their charts of man's achievements and their prognosis for his future. It is impossible to select a topic of knowledge in which he could not express himself extemporaneously with emphasis, lucidity and reason, quoting sources freely—even the Bible. He has always been a voracious reader, as well as a cosmopolitan scholar. I was astonished by his linguistic affinity, and often found him studying strange languages as well as conventional foreign tongues. He thus accumulated an extensive and diverse library, although the collecting instinct has exhibited itself in many other ways, notably in stamps which he used to accumulate in sheets, essentially unclassified, scorning the highly commercialized collector's albums of single stamps.

Diversity of interests is reflected in his astonishing breadth of taxonomic knowledge. I majored as an undergraduate in entomology, and prided myself on a broad superficial knowledge of North American insect taxonomy, yet to my surprise Taylor in the field could recognize families as well as I, and in addition he knew exotic families totally unfamiliar to me. He is one of the nearly extinct breed of "naturalists," knowledgeable in almost every form of macroscopic life. Although recognized primarily for herpetological contributions, his "Mammals of the Philippines" is a reprinted classic, and he had written a comparable monograph of Philippine fishes, the completed manuscript for which was lost on one of his voyages.

Such breadth and depth of knowledge is as dazzling and incomprehensible to the ordinary person as the universe itself, and in some ways the two are comparable. Galaxies of knowledge, continually augmented, incomprehensibly vast, are confined unbelievably within

the recesses of his brain, mysterious and awe-inspiring. One marvels how such prodigious quantities of knowledge can be accumulated, for the experience of most people is that knowledge can be acquired only by dint of concerted efforts requiring bursts of self-discipline that can be maintained but briefly. The answer cannot, I think, be found solely within the resources of common man. It is true that Taylor has always wasted little time, that his efforts are persistent and long-enduring, but these are qualities many others duplicate, with but modest results. Unique appear to be the easy retention of every memory input, and the easy accessibility of the stored information. These are the marks of genius that lift the capacity of the great, like E. H. Taylor, far beyond the most dedicated and astutely-planned reach of the ordinary mortal.

The clinching consideration in this context is the mental attitude associated with the growth of Taylor's stature. The ordinary mortal, hell-bent for immortality, consumed by ambition to reach the highest possible pinnacle of stature, is typically a neurotic, tense, intense person, often hounded by a one-track mind, driving unceasingly until he drops from exhaustion. One would expect some similar sort of effort to characterize anyone with Taylor's attainments. The miracle is that this is not so. He is always ready for social indulgence, for a bullfest, for a session of bridge. Indeed, bridge has long been one of his prized diversions, and he was good enough at it to become one of the state champions in Kansas, with little deliberate effort. He was far too demanding a player for most of his colleagues, for his partner would of necessity have to at least approach his skill, whereas in fact the faultless memory and skillful deduction his game required exceeded the capacity of all but very few. Had he so desired, he no doubt could have become a national or international champion.

His life-long addiction to bridge is but one evidence of the extraordinarily relaxed mixture of work and play that pervades his entire career. Who else could match his achievements and his knowledge, and have at the same time so freely played the part of social lion, have been so invariably free for discussions, of both the idle chatter and the intellectually probing type, and have become the connoisseur of movies, plays, drama, bridge, books *etc.* that he has been? None, within my experience. He has become truly a giant among men, and only those with the most exceptional given talents could hope to approach his achievements. I well remember his kindly remonstrance that I should try to develop an ability to carry on an idle conversation, exercising the social graces that came so naturally to him. After long and unsuccessful effort to nurture it in me, he gave up, with regret but in resignation to the seemingly inevitable limitation of ability that to him was so foreign.

A distinctly social life has always been a conspicuous attribute of

this extraordinary man. He delights in the amenities of a stimulating association, but as a rule avoids dullards except in a strictly professional context. When I was his student, in the 1932-1936 era, he led a diversely exciting life, frequently entertained by others who enjoyed his quick wit and brilliant conversation, and in turn entertaining them, often *via* "line" parties since his small living quarters did not permit entertainment of even moderate-sized groups. Thus scarcely a notable play or movie escaped his attendance, and as an adjunct of a good conversationalist he devoured insatiably all new literature or reviews thereof, as it appeared.

As a gracious host or guest Taylor has had no peer. He has been and is now equally at ease among the great and the small. Through his entire life he has not infrequently consorted with royalty, top-level administrators, presidents, the eminent in every field: they have been accepted in his life, and he in theirs, on essentially equal terms. Yet with equal ease he opened his doors and all his facilities to troops of students who would drop by unannounced, hoping for and receiving hospitality far beyond reasonable expectation. I have seen his cramped quarters virtually covered wall-to-wall with sleeping visitors on an overnight stop on a collecting trip.

The impact of no luminary can be measured accurately in reference only to his direct output. Consideration must be given to indirect but nevertheless often profound effects upon the output of others. The echoes of Taylor's influences, in this context, are incalculable, impinging directly upon colleagues through personal contacts or through correspondence or even publication alone; upon students and their professional life styles in formative stages; upon successors through publication; and indirectly upon those influenced in turn by the many sorts of direct contacts as here interpreted. The impacts are those of a figure legendary in his own time.

Although none of Taylor's students have ever approached his ability and achievements, the magnitude of his student influence should not be underestimated. Many more embarked upon their professional careers under his impetus, finishing their doctoral or other degrees elsewhere, than completed their apprenticeship under his tutelage. A roster of students who came significantly under his wing of influence at some time in their predoctoral careers would be enormous, and would represent an extraordinarily broad spectrum of scientific endeavor. Any list I could venture would be grossly incomplete and would risk an injustice through significant omission. I therefore refrain from presentation of such a list here, although it is to be hoped that the list nevertheless will be compiled.

Whatever the content of such a list, its most notable characteristic would be a complete lack of stereotypy. Many powerful personalities in the academic world leave an indelible stamp upon virtually all who emerge from their mill. Herpetology has had its sources for

inveterate nit-pickers and hecklers; for paranoids; for secretive workers unable to trust others; for products who maintain aloofness; for politically-oriented graduates; for graduates steeped in skills of one sort, woefully deficient and even unappreciative of others. Although in recent years the clannish individuality so conspicuous in many institutions in the past has greatly diminished, it is an unfortunate fact that in the early decades of the 20th century herpetology was notably an endeavor marked by a high level of antagonistic protagonism lending itself to intradisciplinary rancor and ill-will. As one rather detached herpetologist once told me, he never met a herpetologist who wasn't an S.O.B., and never met an ichthyologist who was. It was an intellectual climate no doubt produced by the predominant amateurism, sometimes nurtured to professionalism and sometimes not, that has always distinguished herpetology from ichthyology. Ornithology, although likewise strongly rooted in amateurism, has not suffered (at least in the 20th century) from amateurish bickering as has herpetology, perhaps because of its considerably greater maturity.

In such a climate Ed Taylor has long been in a position, because of his own emphatic, unrelenting views, to produce students cut from the same cloth, stamped with his own trademark. But such has not been the case. Ed respected each student's individuality and left it free to develop in its own unique pattern. Most are marked by a common penchant for industry, but collectively they exhibit almost every extreme and intermediate state in professional and personal attitudes, abilities, direction and achievement. Ed's ability to instill a fire of some sort of ambition, without limiting its direction or extent of expression is one of his greatest marks of genius—and because of its lack of obvious attention-getting focus, one of the least appreciated facets of his greatness.

The era of my student days with Taylor loom in memory as a sort of Golden Age, as perhaps the greatest of that context for all concerned, when Ed had his most memorable students, as well as we our most memorable apprentice association. It is probably a strictly egocentric and erroneous impression for there no doubt were many other uniquely epochal periods in his long reign as the greatest of the zoologists at KU, but it is a harmless belief however suspect it may be. Byron Leonard, Max Elias, David Dunkle and Clarence Hibbard were outstanding in those days, when many field trips and bull sessions were shared in a context never duplicated. The spark and unification of this group, as with others before and after, were provided by Ed Taylor, for whom all developed a reverence as durable as life itself.

None of Taylor's students more unreservedly tendered an adulation for him than Claude Hibbard, who owed much of his scientific impetus to Ed. Indeed, without Taylor, Claude very likely would

have returned to the farmer's life whence he came, particularly because of the tremendously traumatic declaration by the Dean of the Graduate School at The University of Kansas, when Hibbard was applying for admission, that he was incapable of graduate study and should return to more physical endeavors. Hibbard's ultimate admission despite the Dean's objection, and his completion of the doctorate in angry defiance of the challenge to his intelligence, can be attributed in large measure to Ed's influence. Hibbard maintained throughout his life an unflinching devotion to Taylor, developing a scientific eminence and a legendary character that are a credit both to himself and to his model. His untimely death was understandably a great personal loss to Taylor as well as a tragedy for his chosen discipline in vertebrate paleontology.

Part of the reverence tendered in general by his students came from the fact that, although Ed certainly enjoyed a somewhat sybaritic life when convenient, in which we very little shared, it was not regular or particularly sought; it was not a fixed way of life, in part at least because he has never been greedy, as evidenced by the spartan comforts he has regularly maintained. In a culture very strongly possessions-oriented, he has steadfastly refused to clutter his life with an abundance of trivia; his living quarters are always simple and austere, readily shifted from one place to another. Living flexibility has been the result, avoiding the increasingly firm anchorage that the ordinary person forges by acquiring progressively more belongings. Thus Ed freely passed on to others that which others often hoard, and has delighted in sharing with others; and, he has given credit where credit was due. Indeed, he has frequently refused to accept credit himself where it was plainly due, preferring to give others an impetus they could consider their own and perhaps maintain, not leaning indefinitely on others as a crutch. His interest in others is almost insatiable, but it has a constructive quality that is so often lacking among those who relate extensively to their fellow persons. This attitude has led him on occasion to save human lives by his own physical efforts, sometimes at severe jeopardy to his own and under the most desperate circumstance. He talks of these occasions with reluctance, for he does not enjoy beating his own drum and takes the attitude that he should be judged by what his associates see for themselves, not what he tells them is so.

His open interest in others indeed finds the opposite relative to himself; he has long detested knowledge by others of his affairs, his plans or personal activities. Personal revelations to specific individuals for specific purposes were expected to be kept confident, and failure to maintain such confidences would usually evoke sharp rebukes. He did not welcome a "press agent" except under strictly controlled circumstances. Honors have pleased him, but they concern his past professional life which he properly takes as an open

book; but he has always resisted strenuously any invasion of his private life, or of professional activities in current progress or planned for the future. As befits a complex person, he has led several lives simultaneously, and not all of them are ever likely to be revealed. His associates in one are likely to be no more than vaguely aware that there are other lives, in different dimensions, unfolding at the same time. We know but vaguely that after World War I he spent considerable time (1-2 years) in Siberia for our government, reaching the Urals from the east. We also know that in World War II he was active in a role of information-gathering and on-the-spot policy-direction in the Indonesian and southeast Asia area. But these activities are shrouded in mystery that only the inspection of secret files will ever reveal in full.

This is one of the incomprehensibilities, to ordinary folk, of genius. Another infathomable is the occurrence in genius of some attributes that appear to be inconsistent with the general pattern. Ed, for example, has always been of essentially catholic tastes in his personal associations, from the humblest peon to a haughty ruler, from laborers to arm-chair philosophers, showing the broadest compatibility on at least a superficial, working basis. Yet some conspicuous areas of bias and prejudice exist in which his scorn and revulsion are insuppressible. He used to try to avoid contacts wherein prejudice would show, and resented being maneuvered into situations that would reveal them. He would flatly disclaim prejudice, yet give unmistakable and often painful evidence of it, simply by mannerisms. To a very considerable degree the parameters of his prejudice have been dictated by personal rather than group characteristics: by any evidence of greed, incompetence, stupidity or lack of integrity. His prejudices were revealed largely by the rare, inadvertent or coincidental mixture of peoples with whom separately he was compatible but together had little in common. The complex person wears a different personality for different associates, and the intermingling of associates calling for different personalities inevitably leaves some people injured, for no one personality can fit them all as they are accustomed. A simpler one-personality person encounters no such difficulty, for he leads but one life, known to all. The personal segments rigidly associated to form the separate lives of a complex person are indeed incompatible when displaced by some rare event into the improper association.

One group Ed has long commonly avoided is the health-related professions, at least in professional contexts. Fortunately he has been exceptionally healthy throughout his life, but in every illness he has much preferred his own ministrations rather than those of professionals. One cannot deny that his minimal contacts have been quite sufficient. The average person would seem to be far more ready to seek medical help than necessary or even desirable. When

he incurred the only bite of which I am aware from a deadly poisonous snake (*Crotalus cerastes*), he continued his collecting with but brief interruption. Indeed the bite of a rear-fanged *Conopsis vittatus* caused him more protracted discomfort than the rattlesnake bite.

He fought off severe fevers in the Philippines, but seemingly acquired an immunity to the wide-ranging scourges that used to haunt visitors to tropical regions anywhere in the world, including Mexico: dysentery and malaria. He took few precautions in Mexico when I traveled with him, and never contracted either disease. We boiled our water very carefully, but avoided malaria primarily by keeping our distance from human habitations, and by using mosquito nets. We took quinine in those days as a preventative, but he was quite casual in its use whereas I regularly maintained a presumably preventive dosage. On our first trip I was not so resistant to dysentery as he, and was briefly housed on one occasion in a casa de huespedes managed by a sympathetic owner of considerable nursing skill. Never again did the occasional infections of similar nature prove so debilitating or protracted. We both avoided malaria, but on subsequent trips I was not so fortunate, contracting a recurrent infection that was finally subdued several years later with massive doses of atabrine that irremediably destroyed a considerable portion of my hearing. In all of this time, and subsequently, Ed's immunity, however inexplicable, protected him from the disease.

In our culture, however, durability is marked by, as much as anything, a high order of sensitivity and ingenuity of adjustment to physiological need and endurance. Medical advice sometimes helps, but over the long haul the struggle for life is extensively a matter of personal resourcefulness, of which Ed Taylor has long demonstrated an exceptional supply.

Although the average person may seek medical aid too readily, on the other hand he is not blessed with the superb physique and constitution of an E. H. Taylor. I am not aware that Taylor ever indulged in any deliberate body-building regime at any time in his life, yet his normal activity seems to have been strenuous enough to maintain excellent condition. His bodily flexibility is as great now as ever, if not greater. In the field he never let physical difficulty stand in the way of obtaining the best results—he would climb the steepest hills, dive into the most forbidding recesses, turn the largest stones, hunt in the most miserable weather, maintain a rapid pace almost impossible for others to equal. He has always been a powerful swimmer, and floats with such ease, thanks in part to his barrel-like chest, that he could readily smoke and read a book while lolling in total comfort afloat. One could almost believe his avowal that he would rather swim a mile than walk it. His most dramatic rescue of another's life came after his boat was sunk far offshore in the western

Pacific ocean, and he towed a non-swimmer to safety through super-human effort extended almost beyond the limit of his endurance—a feat that had its after-effects of sharply limiting his endurance. The man whose life he saved could scarcely muster a cordial nod when encountered a few years later—a poor exhibition of gratitude.

Ingratitude for his generosity has been an all-too-frequent response, and has been responsible for some bitterness on Ed's part. Taylor has often carried an aura of remoteness and aloofness even in proffering aid in one way or another, no doubt in a self-protective stance guarding against the ingratitude that might come even in acceptance. It is most unfortunate that the warmth that lies behind the generosity has not more widely been appreciated.

A person with such high standards of conduct could not be expected to be accustomed to excessive indulgence. Ed has always eaten sparingly, although he appreciates good food; he is not, and never was, particularly a gourmet. He used to enjoy tobacco, almost invariably in the form of cigarettes, although he rarely permits himself this pleasure now. When I was a student he would occasionally chew a cigarette rather than smoke it; even when smoked a cigarette would likely have a well-chewed butt. He nevertheless curbed the habit with seemingly little difficulty, for the addiction was mild; he was not a chain smoker. In like fashion Ed has always enjoyed the stimulation of a few cocktails or wine, for he found that in moderation they sharpen his wit—a pleasant adjunct on a social occasion. He derives no pleasure from drinking alone, and never to my knowledge indulged to the extent that his wits were dulled.

Although not exactly neatly organized or meticulous of detail, Ed is firmly accustomed to a rather high level of presentability on any occasion. I cannot remember a full beard at any time, although a moustache made its appearance on occasion. Cleanliness is a personal fetish, however; on field trips he insisted that we bathe frequently, wash our clothes regularly and maintain a clean-shaven appearance. At the time I knew him best his dress at the University would have been regarded as casual, although today the same standard borders on the meticulous, as "casual" has come to imply virtual disreputability of attire.

Although a seemingly intensely virile male, Ed's marriage in 1916 to a beautiful and talented girl, Hazel Clark, was of short duration, followed by a separation in the 1920's. Neither partner subsequently married, in keeping with the Catholic influences evident in their lives. Three talented children were born during his brief marriage, one deceased, the others Richard Clark and Patricia Anne. Although the children remained to maturity in the custody of his wife, Ed always adored the entire family and has frequently visited all its members over the years. It is in some ways unfortunate that the family broke up, but it is clear that had it remained intact Ed's career

would probably have been vastly different, and whether better or worse is known only to the gods.

One of the most reassuringly human weaknesses of Ed Taylor has been his abiding impatience with mechanical intricacies and temperamentality. Gadgets that require sympathetic and understanding human ministrations to perform properly—like radios, fountain pens, recordplayers, cars, almost everything created by man—have always come to an early demise in his cold expectation of an efficient operation naturally to be expected of any mindless mechanism built by humans to serve humans. Failures of these mechanisms indicate merely that they have a mind of their own, perversely antagonistic without exception. Their inevitable and usually prompt malfunction leads Ed in succession to berate them soundly with fine invective, to give them another chance to behave properly, and finally to discard them in an exasperated, helpless rage as a total loss, unworthy of further effort. It is a natural chain of reactions familiar to us all, but commonly we swallow our impatience and smooth over the misunderstanding with good-willed attention to apparent need. Not so with Ed. There is for him nothing but anger that an object clearly built to provide convenience should have the effrontery to fail to do so. In the magnitude of his scorn there is seldom a chance for reconciliation.

On occasion, however, when particularly at the mercy of some mindless tyrant, like a car far from ready aid, he has been known to try to soothe the beast with sweet talk. Unfortunately he seldom managed to control his resentment well enough to assuage the balky mechanism, and the inevitable solicitation of aid from other, more empathic humans did nothing to raise the mantle of black resentment. It seems likely that such innate impatience with the inevitable moments of weakness in even the best of inanimate servants has extended also to animate ones, at least to a certain degree. It is not surprising that beasts of burden have never been a favored method of transportation with him, or that bonds of affection rarely formed with servants.

In retrospect, some of the most hilariously humorous incidents in the collecting episodes I shared with Ed in several seasons in Mexico were a product of his impatience with recalcitrant cars, of which a rapid succession served brief tenure in his life. There were no automatic transmissions in those days, and thus it was necessary to shift manually from low gears to high. Not infrequently Ed's total concentration upon other matters would deprive the car of a full sequence in the series of shifts, so that we would blithely cruise down a road mile after mile in second gear until finally the car spoke loudly enough to obtain the final step. On little-used roads where the light traffic permitted attention to matters other than driving, Ed would intently scan both sides of the road for likely-looking col-

lecting sites, paying minimal attention to the road. Following behind the car of a friend on one occasion, he was searching the countryside as usual as the road took a sharp turn at a stone fence. His friend negotiated the turn in stride, but heard a loud crash behind as Ed continued straight on into the fence. No harm was done, as the road was too primitive to allow much speed.

If any mudhole was available, it seemed to beckon irresistably to Ed's car. Commonly his cars fought back against their insensitive driver by developing clogged or leaky radiators that necessitated stops every few miles for roadside water. The tube tires of those days were also a source of endless trouble. Frequent stops made the motions for wheel removal virtually reflexive, occasionally leading to complete unfolding of the sequence on an intact tire.

His greatest triumph over a persistently rebellious car came with me one day in 1932 when, near the end of a long, 3½-month foray over mostly atrocious roads, the rear-end gasoline tank loosened and dropped off in the middle of a seldom-used trail in northern San Luis Potosí. The noise of its departure was not immediately noted, for noise of all sorts was our constant companion among 2-liter cans of specimens and the other paraphernalia of camping that incessantly bounced and rattled on the rough roads. Not until the car stopped did we realize in horror what had happened. Naturally the tank had landed upside down, and from it gurgled our fast-diminishing fuel supply. We raced back to the tank, carried it back to the car and placed it solicitously on top of the pile of miscellany on the back seat, where we inserted a long rubber siphon to carry fuel to the carburetor. This makeshift device sufficed briefly as I held the siphon in such a position that a flow could be maintained. Before long, however, the sloshing gasoline supply lowered to such a point that a continuous flow could not be maintained. We then poured the gasoline into a gallon jug which I held in the front seat, high enough to maintain a flow. We filled the jug several times, but the ancient rubber siphon soon sprang a leak from persistent bending, requiring it to be shortened from its former ample length to one that would reach only by holding the jug out the window. Finally the gas supply was completely exhausted, and Saltillo was still some 30-40 miles to the north. We had in all the intervened time met no other cars, but in due time a truck did appear, from which the driver kindly allowed us to siphon a few liters of gasoline. We then continued our slow struggle to reach Saltillo, where the gasoline tank could be reinstalled, with frequent stops to restore the flow of gasoline, or to pour more into the jug, or to cut down the leaking rubber tube as it sprang more leaks. Eventually it was necessary to stand on the running board, holding the jug as close as possible above the carburetor, in order to feed gasoline through the siphon to it. Throughout this long drive Ed was steering with half vision, since

the hood had to be kept up on one side. This caused some difficulty once we reached Saltillo, maneuvering around parked or passing cars, curbs and other obstacles. We eventually reached a garage, with very little gasoline to spare and the siphon down to about 16 inches, totally nauseated by the endless sucking of gasoline to restore the flow through the siphon. Had we known then what we now know—that gasoline is highly toxic, only 4 ounces being fatal—we might have devised some other solution to our problem. We were amply aware that the amounts we did ingest “can cause headache, nausea, vomiting, vertigo, visual disturbances, mental confusion, loss of coordination,” etc., as stated in one recent popular summary. Eating was a mixed pleasure for some time—a tragedy for me, for it was rare indeed that we ate at a restaurant rather than preparing our own food.

Meal preparation on field trips was, of course, an imposition upon valuable time that could better be spent collecting or preparing specimens, or cataloging them, or writing a brief journal. On our first trip through Mexico, we ate rice regularly—morning, noon and night—varied only with additives in the form of canned evaporated milk (usually for breakfast), canned meat, fish or vegetables at noon, and the same at night, polished off with a dessert of condensed milk on rice. Although it was an austere fare, we came to enjoy it for its simplicity and sufficiency, and I continue to recommend it, supplemented with vitamins, as a regular field diet. We did vary the regime with oatmeal, *pan dulce* and occasionally a fresh chicken, but the staple remained unchanged. Our primary annoyance was provision of a fire, for we had no stove. We burned wood, and since we were travelling in the rainy season most of the time, we carefully hoarded meager supplies of dried wood whenever we could find it, carrying a bag of small pieces in the car with us. On later trips we used a Coleman stove.

Seldom did we stay more than one night in one place—we were incessantly on the move, and seldom did our clothes and boots dry out except in desert regions. As a shelter we used a lean-to tarpaulin slung from one side of the car, under which we spread two army cots that served as chair and table as well as bed. Conveniences were, in effect, non-existent. Although travelling much of the time, we set ourselves a goal of an average of 50 specimens/day, and we achieved it, bringing back some 5500 specimens from our 3½-month foray. We always aimed for and usually achieved the same standard on subsequent trips.

Many memorable experiences arose from the several trips with Ed, and as time has passed since then they have become largely disembodied recollections, disjunct in time and often in place. In 1932 the Pan-American highway did not exist south of Ciudad Victoria, but was represented by a single-lane trail on which other cars

were seldom seen, and beside which we could camp almost at random. The road from Cuernavaca to Acapulco was likewise but a trail, and it was impossible to reach Veracruz in the rainy season along the rutted road through Jalapa. There were very few paved roads anywhere in the country. Oaxaca was accessible only by train—we tried diligently to reach it by car but the primitive roads were simply impassable beyond certain points for anything but a truck. We deliberately sampled every road radiating out from Mexico City that we could find, using the very simple road maps then available. We tried three or four approaches to Veracruz, and didn't make it; two to Oaxaca, never reaching it; and one to Acapulco, which we did reach. Exhausting the southern possibilities, we tried to reach Guadalajara, and could not, and then swung north through Guanajuato into San Luis Potosí and the famous run to Saltillo, following with a foray westward toward Durango (unattainable). The free-wheeling traveller in Mexico today can scarcely imagine the difficulty of travel almost anywhere in the country but 40 years ago.

I well recall the dread mystery of our first entry into the tropics along the trail south of Ciudad Victoria, where we drove almost all night, unable to pull off the road as the tropical vegetation loomed over us from both sides; of our excited discovery the next day of *Anelytropsis*, in rotten tree trunks not far from our first stop; our careful negotiation of the one-lane trail through the formidable Sierra Madre Oriental above Tamazunchale, where chain-gangs worked the road in preparation for the highway yet to come, and where the outside car wheels dropped into thin air around sharp bends as the one-way road skirted precipitious slopes; the nocturnal drive creeping through the fog at the top of the 3000-ft. sheer slope above Acultzingo, where we could only feel our way at night into a camp high on the ridge and could do little better during the day, until finally the fog lifted and we beheld breathlessly the spectacular vista from our precarious perch; the sight of snow-covered Popocatepetl, rearing in unearthly majesty from above a canopy of clouds intervening all the way from our road above Cuernavaca to its white cone; the murderous sandflies and mosquitoes, one taking up where the other left off, at the crossing of the Río Balsas, where a blessed downpour led to our discovery of dozens of *Bipes* where they sought refuge under rocks; the freshly-dropped dagger along a horse-trail in San Luis Potosí, retrieved in dread of immediate contest, but even now admired for its primitive but consummate skill of workmanship, wrought from a file; nights spent completely lost, after hunting for frogs, huddled in a crevice to await the dawn; the casual capture of a small *Bothrops atrox* initially thought to be a harmless *Leptodeira*, seen in the dim light of a fading Coleman lantern (had it bitten, as it should, a personal history would have been far different); the successful capture of 17 *Crotalus molossus* found under

one rock; and other visions that crowd upon each other as events of long ago pass in review. The experiences with Ed laid the foundations for many successive personal forays, with David Dunkle, Henry Thomas, and ultimately with my wife Rozella and our mutual benefactors in the field, especially Thomas MacDougall and Dyfrig McH. Forbes. We all owe our herpetological direction and motivation to one person, Ed Taylor.



FIG. 4.—E. H. Taylor, about 1936, in the field in Sonora. The famous "lantern jaw" is particularly evident. Photo by Sutton, courtesy of Kraig Adler.

Although my own horizon never lifted beyond Mexico as an area of real interest, Ed's continued to expand. Having essentially exhausted the cream of Mexico, that episode closed and was replaced by a period in Costa Rica, where he spent several seasons, some in

company with his son, Richard Taylor, who proved to be good enough a collector to satisfy Ed's exacting standards and even to merit a few commendations. Even that interlude was exhausted, however, as he turned to other fields opened up by the second World War, following a pattern of succession of major periods of interest in different parts of the world.

For the ambitious field collector, no better model could ever be found than Ed Taylor. I really believe he is the best who ever lived. He once said he would rather collect all the time than do anything else, were it financially feasible. He must have acquired several hundred thousand specimens through the years of his activity, particularly of amphibians and reptiles but also of insects, fishes and mammals. Anyone having collected once with him is spoiled; rare indeed is anyone acceptably nearly equal. For him, field work has been the full life; the very thought of wasting any time doing anything else while on a collecting trip was characteristically viewed as a sacrilege. Diversion in the form of cantinas, restaurants, motels, or the more notable sights that entrance most tourists, was regarded as unthinkable except as necessity demanded. The only diversion needed is collecting itself. He was a veritable whirlwind in the field in his more active years, when I collected with him. By extending myself to the utmost I could keep up with him, but it was a pace few could long maintain, and certainly not I. For him it seemed no great effort—but of course few are blessed with the physical strength and endurance to maintain his pace. A collector need not have Taylor's stamina to be great, however; the mark of greatness is the ability to be completely absorbed and completely content with field collecting and observation, recognizing that the opportunities for work in the field are rarities to be treasured and savored to the full—let other amenities of life not interfere, and let them in turn be savored when they are more appropriately sampled in the intervening epochs of inescapability from the clutches of civilization. Few collectors rise to such a standard, but they cannot otherwise truly be great; I doubt that a greater has ever been known.

Taylor was indefatigable through most of his life, but that alone does not account for his unique success, although it is an essential ingredient. Equally essential is his sensitivity to the best places and ways to hunt. He is limitlessly ingenious in spotting sanctuaries others would not envision—digging with the hands in old stump-holes, with a spade in seepages, searching in bromeliads, in axils of leaves, among dead leaves on the ground, watching far ahead and near at hand for movements, walking with a gasoline lantern, in the rain, after rains, pawing in mud and leaves thrown onto shore, examining the foam at the edge of a raging flood, and ceaselessly seeking in endless other combinations of time and place. It is this sensitivity to the most favorable circumstances of time and place,

the knowledge that for every combination there is some inhabitant, combined with the ceaseless delight in exploitation of that sensitivity, that raises him far above the ordinary collector.

Although a careful recorder of data for his specimens, he never developed the art of field records to the extreme that has become common practice, simply because it seemed unprofitably slavish to a system. When notes seemed of probable value, he would take them, even voluminously; when only banalities would result, he did not waste the time. The training in taking notes just for the sake of establishing a habit seemed to him superfluous, a useless relict from the days when naturalists hung on every word of the observer in a virgin land. In some ways it seems regrettable, in retrospect, that Ed did not preserve a detailed field log at least in some areas, for indeed they were essentially virgin lands at the time.

Although eschewing the niceties of a detailed field log, he has always been well aware of the necessity of assuring without question the source of every specimen, and the desirability of preparing the material in as presentable a condition as possible. Every specimen of amphibian or reptile he separately tags, its locality and related data recorded in a catalog. In addition, Taylor was the first, I think, to adopt in this country the "spreading" technique of specimen-hardening, arranging each specimen in a lifelike position and hardening it in a shallow pan of formalin before dropping it into a larger container of preservative. Large snakes were neatly coiled. Many others later adopted these techniques, so that today they are essentially standard. Even commercial collectors, notably W. W. Brown, adopted his procedures, with beautiful and notorious results.

Not until very recent years, with an NSF award for field work on caecilians, did Taylor receive financial aid for his field work. Most was pursued in his spare time, with his own transportation, notably during summers, completely at his own expense. It is therefore not surprising that his collections, except as explicitly subsidized on rare occasion by the University, were considered his personal property, although containers, preservatives and other facilities essential to the study of them were University-provided. Essentially such facilities were provided merely for his study of borrowed materials, as would have been the case had the material actually been borrowed from other sources. That it was his own collection that was borrowed muddled the issue for numerous University officials, who tried all devices to persuade him that the material was rightfully University property—all devices, that is, short of paying field expenses. As a result, in due time his collections were placed on the open market, with much of his Philippine collections going to the Museum of Comparative Zoology, and his Mexican collection going two-thirds to Field Museum of Natural History, and one-third to the Museum of Natural History at the University of Illinois in Urbana. His were

the largest private collections of vertebrates ever accumulated, although their content varied greatly at different times as new material was collected and as the study of different sections was completed and those sections were sold.

His private collection undoubtedly was a major source of fuel feeding the erratically fierce controversies waged over the past decade or two about the right of institutional employees to possess personal collections essentially competitive with those of their institutions. The issue has still not been resolved, although unquestionably the pressure has steadily increased to deny that right, quite in conformance with the rapid growth of institutionalism itself in modern civilization. Concomitantly there has been a general increase in institutional support for field work. Situations probably will never again be conducive to the creation of such a vast personal collection of preserved vertebrate material.

With so many years, calculated at about 23, actually in the field—probably more than any other professional herpetologist who ever lived—predictably Taylor encountered many dangerous situations from which he emerged largely unscathed because of his quick and sensible reactions. On one occasion he spoke regretfully of being a coward, yet no one who ever saw him in action would entertain such thoughts. The mark of a brave man is not that he fails to feel fear, which he might call cowardly, in dire circumstances, but that he devises and executes a successful outcome for all concerned, subsuming if need be his personal welfare to that of his associates. This he has done on repeated occasions.

The notorious genius for discrimination that has been a hallmark of Taylor's work has as its greatest monument the universal recognition of the largely sympatric complex of three species of 5-lined skinks in eastern North America that had completely baffled many experts who had previously struggled to make sense of the perplexing problem. For several decades the solution he proposed was tested from every angle, with the ultimate admission by all that his interpretation was correct. There are numerous other monuments to his originality of thought and uncanny discriminatory ability, and indeed their magnitude seems steadily to have increased. However widely acclaimed his partition of the *Eumeces fasciatus* complex, his astonishing and almost unbelievable discoveries among the caecilians, almost doubling the known species, subspecies, and genera, and even erecting 5 families and subfamilies where there was but one before, must stand as his most enduring and widely influential contribution to herpetology. Never has one herpetologist so completely altered the concepts of such a major group, at every level from the lower to the higher categories. In addition it was Taylor who focussed attention upon the fact that the monstrous old salamander genus *Oedipus* actually represents several genera, and that

great diversity of species exists in most of them, a good share of which he first recognized and named. In like fashion his genus *Microbatrachylus*, although subsequently subsumed in the unwieldy genus *Eleutherodactylus*, is a group in which he first discovered virtually all species, recognizing that they were not simply juveniles of some larger species. Even today most specimens in museums of these species were collected by him and his companions. His recognition of the family Anomalepididae, although immediately attacked from several sides, has led to a major realignment of concepts of classification of the blind snakes, and to revival of his family.

The art of seeking consistently meaningful differences is a projection of personality. Taylor's personality in every way exhibits evidence of the keen sensitivity to and awareness of innuendos or characteristics others overlook completely. The personality of others, insensitive to minute differences, may be expressed through emphasis upon broad relationships equally easy to overlook. Not surprisingly, Taylor became known as a "splitter," to the despair of those at the opposite extreme, the "lumpers."

Two comments upon the polarization are pertinent. First, Ed Taylor is a prime example of the fact that discriminators can also be equally effective in the field of broad relationships, where "lumpers" are supposed to hold sway. On the other hand, many "lumpers" are essentially ineffective in discrimination. Secondly, it is obvious that "truth" requires both fine discrimination and broad generalization; there is a place for both. Some rare workers can work effectively in both ways, and Taylor is such a one. Recognition of the quality of his contributions, and potential, has been seriously hampered by common acceptance of the validity of categorization of all workers as splitters or lumpers—comparable to the tendency to see everything as black or white. A broader realization is long since due that any worker may at any given time or circumstance, or even generally, see fine differences or, conversely, broad generalities; that most workers are not invariably one or the other, but at different times or under different circumstances exhibit either capacity; and that if either capacity is notably missing, it is fine discrimination.

It is true that Taylor's discriminatory ability occasionally has led him to recognize conspecific morphotypes as valid species, but even in these cases the discrimination was both valid and novel, overlooked by others; it was only the interpretation of the differences that went astray. The erroneous picture of Ed as a compulsive splitter is totally inconsistent with the scorn he bestows personally upon multiplication of taxa at the subspecific level. Geographic variation of recognizably single species inspires no enthusiasm in him, with the clear implication that he views such variation as relatively minor compared with variation at interspecific and higher levels. I am not aware that he ever described a subspecies as such, and only with

great reluctance has he admitted that any taxa originally named as species are in reality subspecies. It is obvious that he suffers no compulsion to split, else he would be equally as ardent in segregation of subspecies as in ferreting out species and higher-category taxa. His is a genius of discrimination, a talent that should not be confused with the psychoses of the imperative splitter or lumpers; the discriminator is sensitive to relationships, both broadly synthetic and finely analytical, as they really exist, whereas lumpers and splitters, or the acts of lumping and splitting, are best regarded as the products of compulsive bias that prevent detached evaluation even though they coincidentally at times lead to correct conclusions. Taylor is a confirmed discriminator in the best sense of the word; to label him a splitter does him a gross injustice.

Realist that he is, however, whatever his conviction might be in any given case that he had correctly interpreted the available data, he has never been imbued with the belief that his conclusions were immutable, a product of divine revelation. He is always keenly aware of his human limitations. Nevertheless, he seems to prefer that if he errs, and when he errs, he do so toward over-discrimination, not toward under-discrimination. Obviously, some other workers prefer to risk error in the other direction, but they have no justification in assuming that they thereby are somehow superior to he who risks error toward the opposite extreme. Each helps to offset the other in the crucible of repeated reappraisal.

Taylor's all-pervasive personal integrity is reflected in his personal attitude toward the practice in general of taxonomy. It is inevitable that he views taxonomy as an extremely objective science, in which one must draw conclusions strictly in conformance with facts as they exist, or are seen, with total disregard for convention or currently popular concepts. These are the makings of an iconoclast, although Ed does not qualify for that category in the sense of deliberately seeking concepts to destroy. He hesitated little, however, in promoting drastic conceptual revisions where facts justified them. His philosophy in this context I risk paraphrasing as follows.

Two major objectives of taxonomy are, first, to indicate nomenclaturally the approximate evolutionary stage currently attained by each different population, and, second, to devise the classification scheme that most closely approximates the true relationships dictated by the phylogenetic history of those populations.

Of course, such goals require agreement upon implication of nomenclatural categories and arrangements—an agreement which is slowly being achieved but has been elusive in the past, making the goals of taxonomy, as now understood, completely unattainable in past eras. Indeed, the goals themselves of taxonomy have inevitably shifted as understanding has broadened; only in recent decades could such grandiose goals as those cited above be entertained, for

in earlier times the focus of attention perforce fell primarily upon elaboration of a mere catalog.

The routes to our modern goals have clearly been vastly improved by a clarification of objectives, but they are even yet beset with almost insurmountable difficulties in procuring adequate data. Scouring all fields for every relevant bit of evidence, much remains unknown, first because a total, fully complete survey would require examination of every individual of any given population—a patently impossible undertaking—and second because direct information on the vast succession of individuals that led to existent populations is largely inaccessible. Fossils, casts, and tracks provide limited direct information, bolstered by indirect extrapolation from the nature of extant populations and individuals.

Thus, even in these enlightened times, attainment of the objectives of taxonomy requires exercise of a good deal of judgment, or in other words guesswork. The guesses are often highly educated, but guesses they remain, to varying degrees of probability. Taxonomists by and large are, to a considerable degree, inveterate gamblers, placing their personal bets on this interpretation or that, risking their professional reputations on the ultimate agreement, by a jury as it were, of their colleagues on the validity and significance of their conclusions. Seemingly few indulge in conventional gambling, perhaps because in large part their gambling instincts are fully satisfied by their unique professional opportunities.

Be that as it may, taxonomists take great personal comfort, as do other scientists, from the security afforded by the wide recognition of impartial objectivity that characterizes science in general. They speculate with circumspect freedom, but as scientists their speculations are assumed to be largely unbiased.

Any notably speculative scientific field, however, is vulnerable to *all* influences upon thought—not from facts alone, but also from the quirks of individuality (certainly not a strictly human trait, although obviously most readily observed in humans) that give rise to a predilection for given sorts of interpretation—in other words, to bias. The famed categorization of taxonomists as “splitters” or “lumpers” is a tacit recognition of bias at work.

Freedom from bias is universally recognized as a necessary ideal in science. The most effective step ever taken to reduce bias in taxonomy was introduction of the “numerical” revolution, in the form of “numerical taxonomy.” Its chief contribution was the new focus of attention upon facts and their distribution, leaving as little as possible to personal bias in the interpretation of those facts. Parenthetically this most objective technique of taxonomy was introduced in company with some of the most blatantly biased precepts imaginable, with the result that wide acceptance was regrettably delayed

while the basic concepts were divested of their trappings of biased premises.

Despite the gradually expanding influence of numerical methods, and the objectivity they demand, personal bias remains a major force in herpetological taxonomy today. Much and perhaps all of it is essentially unwitting, but it is nonetheless real and pervasive, to the discredit of the field. Examples of recent date are almost limitless, and they take extremely varied forms, sharing in common largely the neglect of factual implications—of objective interpretations—and the undue weight placed upon personal preference in drawing conclusions, sacrificing or distorting the unvarnished implications of the facts themselves.

Objectivity remains a goal, an ideal, in taxonomy, and progress toward it seems very slow, despite the impetus provided by the numerical revolution. Perhaps it can never be universally attained, and perhaps freedom for a *certain degree* of individuality of interpretation should be recognized as outweighing the goal of *universally* repeatable objectivity. Even thus qualified, objectivity remains a desirable goal, for in its current state at least herpetological taxonomy allows so much freedom for exercise of personal bias that the diverse conclusions are unduly disruptive and greatly stultify its growth as a science.

This is, as I understand it, the guiding philosophy of Ed Taylor. His impeccably unbiased taxonomic works are a model of objectivity, letting the chips fall where they may, irrespective of the images that might be destroyed in dispassionate observation. It is a level of detachment that merits much wider emulation than it receives in a progressively evolving world.

The genius for broad generality is perhaps nowhere more conspicuously evident in Ed Taylor's work than in his dealings with Comparative Anatomy. He deplored texts that lost sight of the forests formed by the trees of that discipline, and for that reason extrapolated from that notable generalizer, H. H. Wilder, in his "History of the Human Body." For many years Taylor daily exercised his powers of generalization by inductive reasoning from the vast variety of facts of Comparative Anatomy, to the enchantment of his students. Indeed, my own textbook in that subject drew heavily upon the broad perspectives painted by Taylor in his lectures in that course. This is not meant to imply that he minimized detail, for the laboratory work he required was truly formidable and certainly far beyond that which can be expected of students at the present time. This was detail, with a vengeance, but it was not allowed to obscure generality.

Vision and experience on exceptionally broad scales were part of the syndrome that made Taylor an inspiring teacher. Equally important was his hypnotic powers of speech. He could transport his

listeners bodily into another dimension, completely captivating their minds, so that they returned to the immediate world of reality with a start, abashed by their susceptibility to the power of suggestion, and awed by the ability of the speaker to so manipulate them. It takes a direct experience on the scene to appreciate its reality and power; description alone cannot convince. Ed's ability as a speaker led in 1932-3 to the presentation of a series of ten highly successful radio talks reflecting his experiences and herpetological knowledge.

Starting his herpetological career before herpetology began its exponential growth, Taylor continued to amass the literature of the field in a way that can never again be duplicated, exchanging reprints with most of the active specialists of his time, thereby including the most significant contributions to the field. In WPA days, before xerox and similar copying devices were available, and when photocopying was too expensive and laborious, he kept many typists, funded by WPA, busy typing word for word the works of earlier herpetologists. By these means, and by purchasing whole libraries and separate works when available, he created one of the greatest herpetological libraries in existence. It was his habit to collect and bind all the works of any given author in chronological sequence, thus minimizing loss or misplacement of individual papers. Some 125 authors are thus immortalized in his library, which in 1968 was acquired by the University of Kansas library (see *Books and Libraries at the University of Kansas*, vol. 8, no. 2, Dec., 1970, p. 2).

Such a dynamic celebrity could not be overlooked by publicity media indefinitely. Among many newspaper accounts, there is one in the *University Daily Kansan* for April 16, 1963; a full page in the *Kansas City Star* for Jan. 17, 1965; and more than a page in the *Lawrence Daily Journal-World* for Dec. 3, 1969. He received a Distinguished Service Citation from the University of Kansas during the Commencement ceremonies May 16-17, 1971; and he is one of the few explicitly honored in the University of Kansas Centennial Medallion of 1966, with a salamander denoting his herpetological contributions (see *Kansas Alumni*, vol. 64, no. 4, Dec. 1965-Jan. 1966, p. 11). These articles, and his radio talks (see bibliography), embrace accounts that document much of the preceding material, but are too voluminous to be repeated here, and are appropriate for incorporation with the autobiographical material of this volume. Other honors have been received from fellow herpetologists, mammalogists, ichthyologists and entomologists who have named some 25 taxa for him, mostly on material he collected.

Most scientists enjoy the stature of authority in one small area of endeavor, or at most two. Each lifetime embraces but one or two epochs. On the contrary, E. H. Taylor can be said to have had at least six eras of activity: (1) 1915-1928, Philippine herpetology;

(2) 1929-1936, the *Eumeces* era; (3) 1937-1948, the Mexican era; (4) 1949-1956, the Costa Rican era; (5) 1957-1964, the Thailand era; and (6) 1965-date, the Caecilian era. The astonishing aspects are first that each era was marked by one or more monumental, monographic works, each era paralleling a lifetime's work for most people; and second that along with most eras came numerous unrelated, incidental yet major contributions. Although Taylor has published a few small accounts, much of his work has been monographic in scope. No herpetologist who ever lived has produced such a combination of variety and bulk of major works. Even Cope and Boulenger, and in still earlier times Duméril and Bibron, do not match Taylor's work, in the indicated contexts. And only one herpetologist of all time, Boulenger, can be said to have been more broadly influential upon the field as a whole. His studies have concerned every major continent, although Australia he dealt with the least. In most cases he was the first really good collector to visit the regions concerned. His interests have extended over not only living but also extinct species of modern orders of amphibians and reptiles, about which he published nine sizeable accounts.

The significance of Taylor's work is enormous in the herpetological field. In sheer bulk alone it outweighs anything produced by any other herpetologist who ever lived, running to some 15,000 pages, which would equal about 25-30 good-sized volumes. Again in sheer volume, the number of new species-group taxa exceeds an incredible 500, new genera number over 25, and new family-group taxa number seven. Major works have spanned 50 years and more, with the earliest appearing in 1921, as the *Amphibians and Turtles of the Philippines*. Monographic surveys continued to appear in a bewildering succession, with four volumes on the Philippine herpetofauna, one on *Eumeces*, three on Mexico, two on Ceylon, four on Costa Rica, four on Thailand and one on caecilians. All are classics of enduring value, standards within their scope for many years yet to come, and indeed the earlier ones have already been reprinted in recognition of the abiding interest they generate. But in addition to these, numerous other large but less synoptic works appeared; small accounts never dominated his output as is true of so many other workers.

Likewise it may be noted that few of Taylor's publications have been co-authored. This fact is a product of two qualities of personality already pointed out: his generosity and his integrity. Numerous monumental dissertations have been completed by his students, often with his extensive participation; yet not a one was ever published under joint authorship with him. It is commonplace for an advisor who has closely supervised and directed dissertations to join as at least junior author, and occasionally even as senior author, in publication of them. Had he done so on every justifiable



FIG. 5. E. H. Taylor in his office in Snow Hall, The University of Kansas, January, 1936. Photo courtesy of Howard K. Cloyd.

occasion his list of publications would be considerably longer, and his real contributions would be more readily evident. In a way it is unfortunate that he did not thus record for posterity the remarkable influence he has had upon a wide variety of herpetological researches beyond that derived from his strictly personal work. In another way

it is refreshingly consistent with his impeccable standards and generous support for his fellow man. However slighting history may be of the real impact Taylor has had upon herpetology, through his reluctance to share authorship credit even where it was overwhelmingly due, he is the greater a man for it, true to himself in a consistent pattern of highest ethical standards. Certainly Ed must be viewed as ambitious, striving for the highest goals of achievement and expecting some recognition of his ability and attainments (although that recognition has never been at a level commensurate with merit), yet he has refused consistently to climb on the backs of anyone, student or colleague; his achievements are strictly his own, and that is the way he wanted them. It has been pointed out (Smith & Smith, *Synopsis of Herpetology of Mexico*, 2:xxv) that coauthorship of technical publications has become a strong trend in recent decades, especially in the Americas, because of academic influences in an atmosphere of team efforts grossly different from the older, museum and continental climates wherein collaboration proved difficult. Ed was not a conspicuous member of that trend, but only because he encouraged his potential co-authors to stand alone in receiving credit for what they had actually done jointly. Most commonly he has accepted coauthorship only where he has done most of the work, and as a gesture of generosity a contributor is invited to share the honor. When someone else does most of the work, his attitude is that to join in authorship, even when his participation has been absolutely critical, would detract from the credit coming to the other—and this he could not do, however justified it might be, as I have learned in exasperation on repeated occasions.

The classic status of much of Ed's work does not represent fully the magnitude of significance of the whole. Many a taxonomic tangle was unravelled through his work, and his discoveries on scale structure of caecilians will make all biologists his debtors forever. Modern critics may complain that much of his work is preliminary, hastily conceived and executed, and therefore unworthy of admiration. It is true that his works are not polished gems of finality, but they have etched a permanent place in the history of herpetology by being a durable framework which, although requiring fleshing-out and remodelling to various degrees over succeeding decades, nevertheless stimulated many times the activity than would have existed without it. Any major contribution is soon tested to the limit by workers who would never have ventured into creativity without something to "shoot at." It is all too easy for snipers, upon finding errors or weaknesses, to judge the creator harshly, forgetting that no progress would have been registered at all without a pacesetter. Let not the essentially trivial lapses that are an inevitable companion of prodigious output diminish appreciation of the progress generated by E. H. Taylor's incomparable activity. Its

effects will never cease to be felt, wittingly or not, however fervent the attacks by self-promoting hecklers on the sideline, incapable themselves of such creativity.

A remarkable attribute of Taylor's work is its originality. Very little of the "scissors and paste" type of contribution has been involved. His numerous synopses and monographs have, to be sure, summarized knowledge in pertinent areas, but all descriptions and illustrations are new. He has consistently abhorred compilations alone, however useful they might be. Expressed in another way, one might recognize three sorts of scientific activity in herpetology, with a number of subdivisions, as follows:

- I. Field study
 - a. Acquisitive (Collecting)
 - b. Observational (unmolested)
 - c. Experimental
- II. Laboratory study
 - a. Anatomical (external as well as internal)
 - b. Behavioral (unmolested)
 - c. Experimental
- III. Library study

Taylor has excelled in acquisitive field study and in anatomical laboratory study, has made some contributions in observational field study and in behavioral laboratory study, but has explored little in the experimental areas, either in the laboratory or in the field. Likewise, although his knowledge of the literature is encyclopedic, he has never written any work based largely or entirely on library scholarship alone. Thus he has never ventured to produce textbooks or lists derived from the literature; his voluminous output has been extensively original, and thereby all the more remarkable, for library research is the most fruitful source for many other abundantly productive workers. Regurgitation of recorded knowledge, even in new arrangements, perspectives and contexts, has never appealed to him. Obviously he has not sought to "pad" his publication record with an output that might be regarded as "easy" from strictly library work. On the other hand one could wish that he would provide, as he could, an excellent supplementary text in herpetology, drawing primarily upon his first-hand experience.

The extraordinary output of new taxa is not likely to be matched in the future, except possibly by workers in the lesser-known tropical regions, simply because the herpetofauna in most parts of the world has become so well known that novelties will be uncovered with increasing rarity. He worked in an exploratory era that is rapidly drawing to a close. Certainly a great deal remains to be learned of the systematics of the herpetofauna of South America and the East Indies, but probably only these areas can provide the materials that would support another E. H. Taylor.

Despite Ed's personal rejection of the "digest" type of research, he maintains a kindly attitude toward others who are, in the absence of ready access to specimens, reduced to literature research if anything were to be done at all. For those who do not exhaust the means at their disposal, however, including talent and specimen material as well as the literature, his scorn could be withering. The occasionally hasty, prematurely produced work by Dunn, however inspired and visionary it often was, formed the ultimate source of the most notorious professional conflict in herpetology of the 20th century.

It is a sad commentary upon the bias of the intellectual community that such outstanding genius for achievement constituted by E. H. Taylor was never formally recognized at the national level, *e.g.* by election to the National Academy of Sciences. Certainly the influence of his achievements far exceed those of some others in the National Academy, whose activity centered in more prestigious areas of expertise. Unfortunately, systematics has never enjoyed much prestige relative to other disciplines, and even among systematists a hierarchy of snobbery exists, fostered to a considerable degree by discrimination of alpha, beta and gamma levels of taxonomy.

Taylor and many other systematists extensively practicing alpha taxonomy have been soundly criticized for ready description of either species or subspecies on the basis of single specimens. The criticisms reveal an unseemly intolerance. Obviously students accustomed to an autecological approach to an understanding of interrelationships would find erection of taxa on the basis of single individuals to be personally intolerable; yet a systematist analyzing populations from an evolutionary point of view could find a single-specimen taxon just as vital to his analysis as taxa known from many specimens. The criteria of justification, in other words, vary greatly in accordance with the aims, background, personality and perspectives of the specialist. There is no categorical "right" or "wrong" to a policy of erection of single-specimen taxa; it depends upon the circumstances. In some contexts it would be egregiously wrong, in others equally proper, and in most, equivocal. I have ample faith in the systematic expertise of Ed Taylor that when he practices such discrimination, he has ample justification for doing so, and that the accusation of "wrong!" is based upon insufficient knowledge or outright intolerance. Although Taylor rarely has described subspecies as such, it bears noting that erection of single-specimen taxa is fundamentally the same in subspecies as in species, since they differ not at all in degree of distinctness, but only in reproductive isolation.

The lack of National Academy of Sciences or other comparable recognition may in part be attributed to the fact that Ed Taylor's career, varied as it is, does not include service in a prestigious administrative post. Indeed, this is perhaps one of the few personal

ambitions this remarkable person did not achieve. It is a travesty of circumstances that prevented him from holding important posts at least at The University of Kansas, particularly as Director of the Museum of Natural History.

However thwarted in some respects his career may have been, it is yet a masterpiece of accomplishment. It is inconceivable that it could have been more productive—it could only have been differently productive.

The trail blazed by Edward Harrison Taylor can of course never be travelled again, for it is unique in time as well as place; times change, and new trails to fit the modern world must be hewed, each to its own time. To compare one person's achievements with another's is impossible, on a realistically valid basis, for each person's journey through time is unique; the heritage and circumstances are different throughout. Nevertheless it is apparent that the mark of E. H. Taylor is of heroic proportions, and although not duplicatable can yet serve as a test of achievement for his successors for many generations. Whether approached or exceeded, time will not alter the knowledge that he has carved the image of a unique, unparalleled giant among men, scientist as well as human being.

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IV
THE PUBLISHED CONTRIBUTIONS OF
EDWARD H. TAYLOR

BY
GEORGE R. PISANI

Edward Taylor's formal research career began in January of 1912 when, after completing his A.B. degree, he accepted a civil service post in Manila, Philippine Islands. The voyage to Manila began a series of research-associated travels spanning close to 300,000 miles and cumulatively totalling nearly a year of sea time. In the past 62 years, he has published 198 pieces of scientific research, which range from 1 to over 800 pages in length and total 9,295 pages. These works have been published in 25 journals (with most in the University of Kansas Science Bulletin) and have been illustrated with 2,140 figures and plates.

Taylor's publications reflect his changing research interests and also give some indication of the extent of his travels. Between 1915 and 1928 he produced an extensive survey of the herpetofauna of the Philippines, followed by a lengthy review of Philippine land mammals in 1934. The period 1929-1935 represents a transition period, with Taylor's publication emphasis being mainly on the herpetofauna of the south-central United States; this period also marks the beginnings of his publications on the lizard genus *Eumeces* and the herpetofauna of Mexico. Nineteen thirty-two to 1936 saw the intensive investigation of the genus *Eumeces*, culminating in 1936 with a monographic study of these lizards. By 1937, Taylor was publishing heavily on his Mexican research, an emphasis which was to continue to 1950.

In 1947, Taylor's first publication on the herpetofauna of south-eastern Asia (a study of Ceylonese snakes) appeared, followed a year later by the first two of his Costa Rican papers. Between 1952 and 1958, Taylor published lengthy treatises on Costa Rican herpetology, and extensively reviewed most of the herpetofauna of Thailand over the following seven years. The concluding paper in the series on Thailand appeared in 1970 (turtles and crocodylians).

Since 1960, Taylor's research has focused heavily on the caecilians (Amphibia, Gymnophiona). His interest in these animals was aroused during a collecting trip on tiny Brazilian Island in the Sea of Celebes. Taylor was collecting large earthworms for a colleague when he noticed that one "earthworm" seemed very different from the rest. Subsequent investigation showed it to be a new species of caecilian. Recognizing the poor state of taxonomy of the Gymnophiona, Taylor undertook a long series of studies on the order. His

1968 review of these unique animals is a major landmark in the scientific knowledge of the group.

Throughout the major phases of his career, Taylor's work can be characterized as pioneering. His publications on the Philippines, Mexico, Costa Rica, and Thailand all provided extensive treatments of poorly understood herpetofaunas. The studies on *Eumeces* and the *Gymnophiona* delve deeply into the taxonomy of complex groups. In the course of time a number of the taxa proposed by Taylor have fallen, as is typical with advances in the methodology of systematics; yet, much has withstood the scrutiny of subsequent investigations and his work remains of fundamental importance to systematists following in his path.

There has been considerable interest in reprinting Taylor's works. The tripartite checklist and key to the amphibians and reptiles of Mexico (Taylor is second author behind his renowned student Hobart Smith) have been available as reprints for several years, and his extensive Costa Rican and Philippine material has recently been reproduced by two Dutch publishers. Sources of all reprinted material are coded in the body of the bibliography ("R-1", etc.) and referenced in Appendix A.

While the bulk of Taylor's writing has been of taxonomic orientation, his interests have produced much material encompassing anatomy, behavior and natural history. Nine paleoherpetology papers appeared scattered throughout the years 1936-1951. At 84 years of age he shows little sign of slowing his research pace as evidenced by his work in press and in preparation.

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BIBLIOGRAPHY EDWARD HARRISON TAYLOR

1915

New species of Philippine lizards. *Philip. J. Sci.* 10(2), Sec. D:89-109, 1 pl.

1916

The lizards of Kansas, with notes on habits. Unpublished thesis (Master of Science), University of Kansas.

1917

Brachymelas, a genus of Philippine lizards. *Philip. J. Sci.* 12(5), Sec. D:267-279, 1 pl., 7 figs.

Snakes and lizards known from Negros, with descriptions of new species and new subspecies. *Philip. J. Sci.* 13(6), Sec. D:353-381, 2 pls., 2 figs.

1918

Reptiles of Sulu Archipelago. Philip. J. Sci. 13(5), Sec. D:233-267, 3 pls., 11 figs.

Two new snakes of the genus *Holarchus* with descriptions of other Philippine species. Philip. J. Sci. 13(6), Sec. D:359-369, 2 pls.

1919

New or rare Philippine reptiles. Philip. J. Sci. 14(1):105-125, 2 pls., 4 figs.

Ipon fisheries of Abra River. Philip. J. Sci. 14(1):127-130.

1920

Philippine turtles. Philip. J. Sci. 16(2):111-144, 7 pls.

Philippine Amphibia. Philip. J. Sci. 16(3):213-259, 10 pls., 9 figs., errata pp. 649-650.

1921

Amphibians and turtles of the Philippine Islands. Dept. of Agriculture and Natural Resources, Bureau of Science (Manila) Pub. no. 15, 193 p., 17 pls., 9 figs. (R-1)

1922

The snakes of the Philippine Islands. Dept. of Agriculture and Natural Resources, Bureau of Science (Manila) Pub. no. 16, 312 p., 37 pls., 32 figs. (R-1)

Additions to the herpetological fauna of the Philippine Islands, I. Philip. J. Sci. 21(2):161-206, 7 pls. (R-1)

Additions to the herpetological fauna of the Philippine Islands, II. Philip. J. Sci. 21(3):257-303, 4 pls. (R-1)

The lizards of the Philippine Islands. Dept. of Agriculture and Natural Resources, Bureau of Science (Manila) Pub. no. 17, 269 p., 23 pls., 53 figs. (R-1)

Herpetological fauna of Mount Makiling. The Philippine Agriculturist 11(5):127-139.

1923

Additions to the herpetological fauna of the Philippine Islands, III. Philip. J. Sci. 22(5):515-557, 3 pls. (R-1)

1924

(with Noble, G. Kingsley, second author) A new genus of discoglossid frogs from the Philippine Islands. Amer. Mus. Nov. 121: 1-4, 1 fig.

1925

Additions to the herpetological fauna of the Philippines, IV. Philip. J. Sci. 26(1):97-111. (R-1)

1928

An incident. *Social Science* 3(1):29-31.

Amphibians, lizards and snakes of the Philippines. in, *Distribution of life in the Philippines*. Dept. of Agriculture and Commerce, Bureau of Science (Manila) Monograph no. 21:214-242, 6 pls., 6 figs.

1929 (all distributed 1930)

A revised checklist of the snakes of Kansas. *U.K.S.B.* 19(5):53-62.

List of reptiles and batrachians of Morton County, Kansas, reporting species new to the State fauna. *U.K.S.B.* 19(6):63-65.

A species of lizard new to the fauna of the United States: *Eumeces callicephalus* Bocourt. *U.K.S.B.* 19(7):67-69.

1931

Notes on two new specimens of the rare snake *Ficimia cana*, and the description of a new species of *Ficimia* from Texas. *Copeia* 1931(1):4-7.

The discovery of a lizard *Sceloporus torquatus cyanogenys* Cope, in Texas, new to the fauna of the United States. *Proc. Biol. Soc. Wash.* 44:129-132.

1932

Leptodactylus albilabris (Günther): a species of toad new to the fauna of the United States. *U.K.S.B.* 20(11):243-245.

(with Wright, John S., second author) The toad *Bufo marinus* (Linnaeus) in Texas. *U.K.S.B.* 20(12):247-249.

Eumeces inexpectatus: a new American lizard of the family Scincidae. *U.K.S.B.* 20(13):251-259, 1 pl.

Eumeces laticeps: a neglected species of skink. *U.K.S.B.* 20(14):263-271, 2 pls.

1933

Two new Mexican skinks of the genus *Eumeces*. *Proc. Biol. Soc. Wash.* 46:129-138, 2 figs.

Notes on type specimens of reptiles and amphibians in the "Alfredo Duges" Museum, Guanajuato, Mexico. *Copeia* 1933(2):97.

New species of skinks from Mexico. *Proc. Biol. Soc. Wash.* 46:175-182, 2 figs.

1934

Notes on Chinese reptiles and amphibians. *Lingnan Sci. J.* (Canton, China) 13(2):297-310.

Zoological results of the third DeSchauensee Siamese Expedition, part III. Amphibians and reptiles. *Proc. Acad. Nat. Sci. Phila.* 86:281-310, 1 pl., 4 figs.

Philippine land mammals. Dept. of Agriculture and Commerce, Bureau of Science (Manila) Monograph no. 30, 548 p., 25 pls., 25 figs.

Notes on two collections of Hainan reptiles and amphibians. Lingnan Sci. J. (Canton, China) 13(3):465-474.

A new species of lizard from Mexico. U.K.S.B. (1933, issued 1934) 21(5):257-267, 2 pls.

Observations on the courtship of turtles. U.K.S.B. (1933, issued 1934) 21(6):269-271.

1935

A new skink from Mexico. Zool. Ser. Field Mus. Nat. Hist. 20(10): 77-80, 1 fig.

Coleonyx fasciatus, a neglected species of gecko. U.K.S.B. 22(9): 203-205.

Arkansas amphibians and reptiles in the Kansas University Museum. U.K.S.B. 22(10):207-218.

A new species of the genus *Eumeces* from New Mexico. U.K.S.B. 22(11):219-223, 1 fig.

1936

Notes on a small herpetological collection from western Australia. Trans. Kans. Acad. Sci. (1935, issued 1936) 38:341-344.

Proposed changes in the nomenclature of the scincoid lizard genus *Eumeces*. Trans. Kans. Acad. Sci. (1935, issued 1936) 38:345-347.

The rediscovery of the lizard *Eumeces altamirani* (Duges) with notes on two other Mexican species of the genus. Proc. Biol. Soc. Wash. 49:55-58.

A taxonomic study of the cosmopolitan scincoid lizards of the genus *Eumeces* with an account of the distribution and relationships of its species. U.K.S.B. (1935, issued 1936) 23(1):1-643, 43 pls., 84 figs.

Una nueva fauna de batracios anuros del Plioceno Medio de Kansas. Anales Inst. Biol. (Mexico) 7(4):513-529, 2 pls.

Notes and comments on certain American and Mexican snakes of the genus *Tantilla*, with descriptions of new species. Trans. Kans. Acad. Sci. 39:335-348, 6 figs.

New species of Amphibia from Mexico. Trans. Kans. Acad. Sci. 39: 349-363, 2 pls.

1937

Two new lizards of the genus *Leiolopisma* from Mexico, with comments on another Mexican species. Copeia 1937(1):5-11.

New species of hylid frogs from Mexico with comments on the rare *Hyla bistincta* Cope. Proc. Biol. Soc. Wash. 50:43-54, 2 pls.

A new snake of the genus *Sonora*, with comments on *S. michoacensis*. Herpetologica 1:69-72, 2 pls.

1938

Notes on the herpetological fauna of the Mexican state of Sonora. U.K.S.B. (1936, issued 1938) 24(19):474-503, 1 pl.

Notes on the herpetological fauna of the Mexican state of Sinaloa. U.K.S.B. (1936, issued 1938) 24(20):505-537, 3 pls.

Does the amphisbaenid genus *Bipes* occur in the United States? Copeia 1938(4):202.

1939

On North American snakes of the genus *Leptotyphlops*. Copeia 1939(1):1-7, 1 pl.

Two new species of the genus *Anomalepis* Jan, with a proposal of a new family of snakes. Proc. New England Zool. Club 17:87-96, 1 pl.

(with Smith, Hobart M., second author) Miscellaneous notes on Mexican snakes. U.K.S.B. (1938, issued 1939) 25(13):239-258, 1 pl., 4 figs.

Concerning Mexican salamanders. U.K.S.B. (1938, issued 1939) 25(14):259-313, 6 pls.

Notes on the Mexican snakes of the genus *Leptodeira* with a proposal of a new snake genus *Pseudoleptodeira*. U.K.S.B. (1938, issued 1939) 25(15):315-355, 5 pls., 7 figs.

On the Mexican snakes of the genera *Trimorphodon* and *Hypsiglena*. U.K.S.B. (1938, issued 1939) 25(16):357-383, 4 pls., 1 fig.

New species of Mexican tailless Amphibia. U.K.S.B. (1938, issued 1939) 25(17):407-419, 4 pls.

A new anuran amphibian from the Pliocene of Kansas. U.K.S.B. (1938, issued 1939) 25(18):407-419, 4 pls.

Frogs of the *Hyla eximia* group in Mexico, with descriptions of two new species. U.K.S.B. (1938, issued 1939) 25(19):421-445 3 pls.

A new bromeliad frog. Copeia 1939(2):97-100, 1 fig.

A new species of the lizard genus *Lepidophyma* from Mexico. Copeia 1939(3):131-133, 2 figs.

1940

A new eleutherodactylid frog from Mexico. Proc. New England Zool. Club 18:13-16, 2 pls.

A new *Rhyacosiredon* (Caudata) from western Mexico. Herpetologica 1(7):171-176, 1 pl.

- Two new snakes of the genus *Thamnophis* from Mexico. *Herpetologica* 1(7):183-189, 1 pl., 2 figs.
- A new bromeliad frog from northwestern Michoacan. *Copeia* 1940 (1):18-20, 1 fig.
- Two new anuran amphibians from Mexico. *Proc. U.S. Nat. Mus.* 89(3093):43-47, 3 pls.
- A new *Syrhophus* from Guerrero, Mexico. *Proc. Biol. Soc. Wash.* 53:95-98, 1 pl.
- Palatal sesamoid bones and palatal teeth in *Cnemidophorus*, with notes on these teeth in other saurian genera. *Proc. Biol. Soc. Wash.* 53:119-124, 1 pl.
- (with Knobloch, Irving W., second author) Report on an herpetological collection from the Sierra Madre Mountains of Chihuahua. *Proc. Biol. Soc. Wash.* 53:125-130.
- New species of Mexican anura. *U.K.S.B.* (1939, issued 1940) 26 (11):385-405, 2 pls., 8 figs.
- New salamanders from Mexico, with a discussion of certain known forms. *U.K.S.B.* (1939, issued 1940) 26(12):407-439, 4 pls., 5 figs.
- Mexican snakes of the genus *Typhlops*. *U.K.S.B.* (1939, issued 1940) 26(13):441-444, 2 figs.
- Some Mexican serpents. *U.K.S.B.* (1939, issued 1940) 26(14):445-487, 4 pls., 9 figs.
- Herpetological miscellany no. I. *U.K.S.B.* (1939, issued 1940) 26 (15):489-571, 10 pls., 7 figs.
- A new frog from the Tarahumara Mountains of Mexico. *Copeia* 1940(4):250-253, 1 fig.
- A new *Lampropeltis* from western Mexico. *Copeia* 1940(4):253-255, 2 figs.

1941

- New plethodont salamanders from Mexico. *Herpetologica* 2(3):57-65, 5 figs.
- Extinct lizards from Upper Pliocene deposits of Kansas. *Univ. Kans. Publ. State Geol. Surv. Kans., Bull. no. 38, Reports of Studies, pt. 5:165-176, 6 figs.*
- Extinct toads and salamanders from Middle Pliocene beds of Wallace and Sherman counties, Kansas. *Univ. Kans. Publ. State Geol. Surv. Kans., Bull. no. 38, Reports of Studies, pt. 6:177-196, 7 figs.*
- A new plethodont salamander from New Mexico. *Proc. Biol. Soc. Wash.* 54:77-80.
- Two new species of Mexican plethodontid salamanders. *Proc. Biol. Soc. Wash.* 54:81-86.
- Some Mexican frogs. *Proc. Biol. Soc. Wash.* 54:87-94.

(with Smith, Hobart M., first author) A review of the snakes of the genus *Ficimia*. J. Wash. Acad. Sci. 31(8):356-368, 1 pl., 1 map, 16 figs.

Two new ambystomid salamanders from Chihuahua. Copeia 1941 (3):143-146, 2 figs.

A new anuran from the Middle Miocene of Nevada. U.K.S.B. 27, pt. 1(4):61-69, 1 pl., 1 fig.

Herpetological miscellany no. II. U.K.S.B. 27, pt. 1(7):105-139, 4 pls., 7 figs.

New amphibians from the Hobart M. Smith Mexican collections. U.K.S.B. 27, pt. 1(8):141-167, 5 pls., 1 fig.

1942

Tadpoles of Mexican anura. U.K.S.B. 28, pt. 1(3):37-55, 3 pls.

The frog genus *Diaglena*, with a description of a new species. U.K.S.B. 28, pt. 1(4):57-65, 2 pls.

New tailless Amphibia from Mexico. U.K.S.B. 28, pt. 1(5):67-89, 4 pls.

Some geckoes of the genus *Phyllodactylus*. U.K.S.B. 28, pt. 1(6):91-112, 6 figs.

Mexican snakes of the genera *Adelophis* and *Storeria*. Herpetologica 2(4):75-79.

"Island" faunas on the Mexican Plateau. Proc. 8th Amer. Scientific Congress 3:503-504.

Extinct toads and frogs from the Upper Pliocene deposits of Meade County, Kansas. U.K.S.B. 28, pt. 2(10):199-235, 7 pls.

(with Smith, Hobart M., second author) Concerning the snake genus *Pseudoficimia*. U.K.S.B. 28, pt. 2(12):241-251, 1 pl., 4 figs.

New Caudata and Salientia from Mexico. U.K.S.B. 28, pt. 2(14):295-323, 5 pls.

(with Smith, Hobart M., second author) The snake genera *Conopsis* and *Toluca*. U.K.S.B. 28, pt. 2(15):325-363, 6 pls., 2 figs.

1943

(with Hesse, C. J., second author) A new salamander from the Upper Miocene beds of San Jacinto County, Texas. Amer. J. Sci. 241:185-193, 1 fig.

A new *Hylella* from Mexico. Proc. Biol. Soc. Wash. 56:49-52.

A new ambystomid salamander adapted to brackish water. Copeia 1943 (3):151-156, 3 figs.

An extinct turtle of the genus *Emys* from the Pleistocene of Kansas. U.K.S.B. 29, pt. 2(3):249-254, 1 pl.

The Mexican lizards of the genus *Eumeces*, with comments on the recent literature of the genus. U.K.S.B. 29, pt. 2(5):269-300.

(with Smith, Hobart M., second author) A review of the American sibynophine snakes with a proposal of a new genus. U.K.S.B. 29, pt. 2(6):301-338, 5 pls., 9 figs.

Skin shedding in the salamander *Amphiuma means*. U.K.S.B. 29, pt. 2(7):339-341.

Herpetological novelties from Mexico. U.K.S.B. 29, pt. 2(8):343-361, 2 pls.

1944

A new genus and species of Mexican frogs. U.K.S.B. 30, pt. 1(3):41-45.

Two new species of crotalid snakes from Mexico. U.K.S.B. 30, pt. 1(4):47-56.

A new ambystomid salamander from the Plateau Region of Mexico. U.K.S.B. 30, pt. 1(5):57-61.

The hylid genus *Acrodytes*, with comments on Mexican forms. U.K.S.B. 30, pt. 1(6):63-69.

Present location of certain herpetological and other type specimens. U.K.S.B. 30, pt. 1:117-187.

The genera of plethodont salamanders in Mexico, Part I. U.K.S.B. 30, pt. 1:189-232.

1945

(with Smith, Hobart M., second author) Summary of the collections of amphibians made in Mexico under the Walter Rathbone Bacon Travelling Scholarship. Proc. U.S. Nat. Mus. 95:521-613, 14 pls., 2 figs.

(with Smith, Hobart M., first author) An annotated checklist and key to the snakes of Mexico. U.S. Nat. Mus. Bull. 187:1-239. (R-2)

1947

Comments on Ceylonese snakes of the genus *Typhlops* with descriptions of new species. U.K.S.B. 31, pt. 2(13):283-298, 3 figs.

A review of the Mexican forms of the lizard genus *Sphaerodactylus*. U.K.S.B. 31, pt. 2(14):299-309, 2 figs.

A bibliography of Mexican amphibiology. U.K.S.B. 31, pt. 2(17):543-589.

Publication dates of Kelaart's Prodrromus Fauna Zeylanicae. Herpetologica 4(1):26.

1948

(with Smith, Hobart M., first author) An annotated checklist and key to the Amphibia of Mexico. U.S. Nat. Mus. Bull. 194:i-iv, 1-118. (R-2)

A new hylid frog from eastern Mexico. Univ. Kans. Publ. Mus. Nat. Hist. 1(15):257-264, 1 fig.

New Costa Rican salamanders. Proc. Biol. Soc. Wash. 61:177-180.

Two new hylid frogs from Costa Rica. Copeia 1948(4):233-238, 2 figs.

1949

A preoccupied name in *Hyla*. Copeia 1949(1):74.

A preliminary account of the herpetology of the State of San Luis Potosi, Mexico. U.K.S.B. 33, pt. 1(2):169-215.

Costa Rican frogs of the genera *Centrolene* and *Centrolenella*. U.K.S.B. 33, pt. 1(4):257-270.

Two new teiid lizards from Costa Rica. U.K.S.B. 33, pt. 1(5):271-278, 2 figs.

New salamanders from Costa Rica. U.K.S.B. 33, pt. 1(6):279-288.

New or unusual Mexican amphibians. Amer. Mus. Nov. 1437:1-21, 6 figs.

A new hylid frog from central Veracruz. Copeia 1949(4):272-274, 1 fig.

1950

(with Smith, Hobart M., first author) Type localities of Mexican reptiles and amphibians. U.K.S.B. 33, pt. 2(8):313-380.

Second contribution to the herpetology of San Luis Potosi. U.K.S.B. 33, pt. 2(11):441-457, 6 pls., 1 map.

Ceylonese lizards of the family Scincidae. U.K.S.B. 33, pt. 2(13):481-518, 8 figs.

A brief review of Ceylonese snakes. U.K.S.B. 33, pt. 2(14):519-603, 14 pls., 1 map.

A new bromeliad frog from the Mexican State of Veracruz. Copeia 1950(4):274-276, 1 pl.

(with Smith, Hobart M., first author) An annotated checklist and key to the reptiles of Mexico, exclusive of the snakes. U.S. Nat. Mus. Bull. 199:i-iv, 1-253. (R-2)

1951

Two new genera and a new family of tropical American frogs. Proc. Biol. Soc. Wash. 64:33-37.

Egg laying behavior of an Oriental agamid lizard. Herpetologica 7(2):59-60.

The rediscovery of the toad *Bufo simus* Schmidt. Copeia 1951(2):134-137, 1 pl.

A brief review of the snakes of Costa Rica. U.K.S.B. 34, pt. 1(1):3-188, 23 pls., 7 figs. (R-3)

- A new Veracruzian salamander. U.K.S.B. 34, pt. 1(2):189-193, 1 fig.
 Concerning Oligocene amphisbaenid reptiles. U.K.S.B. 34, pt. 1(9):521-579, 10 pls., 8 figs.

1952

- The salamanders and caecilians of Costa Rica. U.K.S.B. 34, pt. 2(12):695-791, 13 pls., 14 figs.
 Third contribution to the herpetology of the Mexican State of San Luis Potosi. U.K.S.B. 34, pt. 2(13):793-815.
 A new Panamanian tree frog. *Breviora* (Mus. Comp. Zool.) 1:1-4, 1 pl.
 A new hylid of the genus *Agalychnis* from southwestern Mexico. *Copeia* 1952(1):31-32, 1 pl.
 A review of the frogs and toads of Costa Rica. U.K.S.B. 35, pt. 1(5):577-942, 69 figs.

1953

- Early records of the scasnake *Pelamys platurus* in Latin America. *Copeia* 1953(2):124.
 A review of the lizards of Ceylon. U.K.S.B. 35, pt. 2(12):1525-1585.
 Fourth contribution to the herpetology of San Luis Potosi. U.K.S.B. 35, pt. 2(13):1587-1614.
 A report on a collection of Ceylonese serpents. U.K.S.B. 35, pt. 2(14):1615-1624.
 (with Cochran, Doris, second author) Frogs of the family Centrolenidae from Brasil. U.K.S.B. 35, pt. 2(15):1625-1656, 7 figs., 1 map.

1954

- Frog-egg eating tadpoles of *Anotheca coronata* Stejneger (Salientia, Hylidae). U.K.S.B. 36, pt. 1(8):589-596, 3 figs.
 Additions to the known herpetological fauna of Costa Rica, with comments on other species. No. I. U.K.S.B. 36, pt. 1(9):597-637, 12 figs. (R-3)
 Further studies on the serpents of Costa Rica. U.K.S.B. 36, pt. 2(11):673-801, 40 figs. (R-3)

1955

- Additions to the known herpetological fauna of Costa Rica, with comments on other species. No. II. U.K.S.B. 37, pt. 1(13):499-575, 19 figs. (R-3)

1956

- Sphaerodactylus lineolata* (Reptilia: Lacertilia) in Mexico. *Herpetologica* 12(4):283-284.

A review of the lizards of Costa Rica. U.K.S.B. 38, pt. 1(1):3-322, 76 figs. (R-3)

(with Leonard, A. Byron, second author) Concerning the relationship of certain neotropical gekkonid lizard genera, with comments on the microscopic structure of their glandular scales. U.K.S.B. 38, pt. 1(12):1019-1029.

1957

(review of) A colored atlas of some vertebrates of Ceylon. by P.E.P. Deraniyagala. Copeia 1956(4):262-263 (issued in 1957).

1958

(with Elbel, R., second author) Contribution to the herpetology of Thailand. U.K.S.B. 38, pt. 2(13):1033-1189.

(with Weyer, D., second author) Report on a collection of amphibians and reptiles from Harbel, Republic of Liberia. U.K.S.B. 38, pt. 2(14):1191-1229.

Additions to the known herpetological fauna of Costa Rica, with comments on other species. No. III. U.K.S.B. 39(1):3-40. (R-3)

Notes on Costa Rican Centrolenidae with descriptions of new forms. U.K.S.B. 39(2):41-68, 13 figs.

1960

A new caecilian genus in India. U.K.S.B. 40(3):31-36, 4 figs.

On the caecilian species *Ichthyophis monochrous* and *Ichthyophis glutinosus* and related species. U.K.S.B. 40(4):37-120, 38 figs.

1961

Notes on Indian caecilians. J. Bombay Nat. Hist. Soc. 58(2):355-365, 2 figs.

Some factors influencing distribution and speciation in the lizard genus *Eumeces*. Proc. 9th Pacific Sci. Cong. (1957, publ. 1961) 19:5-6.

1962

New oriental reptiles. U.K.S.B. 43(7):209-263, 18 figs.

The amphibian fauna of Thailand. U.K.S.B. 43(8):265-599, 107 figs.

1963

New and rare oriental serpents. Copeia 1963(2):429-433.

The lizards of Thailand. U.K.S.B. 44(14):687-1077, 98 figs.

1964

A new species of caecilian from India (Amphibia:Gymnophiona). Senck. Biol. (Frankfurt am Main) Band 45(1-12)heft3/5:227-231.

1965

The serpents of Thailand and adjacent waters. U.K.S.B. 45(9):609-1096, 125 figs.

New Asiatic and African caecilians, with redescrptions of certain other species. U.K.S.B. 46(6):253-302, 28 figs.

1968

The caecilians of the world. A taxonomic review. Univ. Kansas Press, Lawrence, Kansas. 848 p., 425 figs.

1969

(with Dryden, G. L., first author) Reptiles from the Mariana and Caroline Islands. U.K.S.B. 48(8):269-279.

Miscellaneous notes and descriptions of new forms of caecilians. U.K.S.B. 48(9):281-296, 9 figs.

A new family of African Gymnophiona. U.K.S.B. 48(10):297-305, 5 figs.

A new caecilian from Brasil. U.K.S.B. 48(11):307-313, 4 figs.

A new Panamanian caecilian. U.K.S.B. 48(12):315-323, 4 figs.

Skulls of the Gymnophiona and their significance in the taxonomy of the group. U.K.S.B. 48(15):585-687, 55 figs.

On the status of *Caecilia occidentalis*. U.K.S.B. 48(19):785-790.

Wiegmann and the herpetology of Mexico. in Wiegmann, A.F.A., Herpetologia Mexicana. Facsimile Reprints in Herpetology no. 23. p. iii-vi (Society for the Study of Amphibians and Reptiles).

Early foundations of Mexican herpetology. Copeia 1969(4):865-866.

1970

An aquatic caecilian from the Magdalena River, Colombia, S.A. U.K.S.B. 48(22):845-848, 2 figs.

A new caecilian from Ethiopia. U.K.S.B. 48(23):849-854, 3 figs.

Notes on Brazilian caecilians. U.K.S.B. 48(24):855-860, 3 figs.

The lateral line sensory system in the caecilian family Ichthyophiidae (Amphibia:Gymnophiona). U.K.S.B. 48(25):861-868, 5 figs.

The turtles and crocodiles of Thailand and adjacent waters. U.K.S.B. 49(3):87-179, 17 figs.

On the status of the caecilian *Indotyphlus battersbyi* Taylor. U.K.S.B. 49(5):337-344, 3 figs.

1971

Scale and cranial characteristics of the caecilian *Brasiliotyphlus braziliensis* (Dunn). J. Herp. 5(3-4):181-183, 2 figs.

The caecilian fauna of Thailand, with an examination of scale characters. Nat. Hist. Bull. Siam Soc. 24(1-2):33-39, 6 pls.

1972

Squamation in caecilians, with an atlas of scales. U.K.S.B. 49(13): 989-1164, 127 figs.

1973

Caecilian miscellany. U.K.S.B. 50(5):187-231.

1974

(with Peters, James A, second author) The caecilians of Ecuador. U.K.S.B. 50(7):333-346.

APPENDIX A SOURCES OF REPRINTED PUBLICATIONS

- R-1. A. Asher & Co. B.V., Keizersgracht 526, Amsterdam 1002, The Netherlands.
- R-2. Eric Lundberg, Natural History Books, Augusta, West Virginia 26704. U.S.A.
- R-3. Linnaeus Press, P.O. Box 4307, Amsterdam, The Netherlands.

APPENDIX B JOURNALS

Abbreviations (if any) used in the bibliography appear in parentheses following the journal name. Place of publication is given for each journal.

- American Journal of Science (Amer. J. Sci.), New Haven, Connecticut, U.S.A.
- American Museum Novitates (Amer. Mus. Nov.), New York, New York, U.S.A.
- Anales Instituto de Biologia (Anales Inst. Biol.), Mexico, D.F.
- Breviora, Cambridge, Massachusetts, U.S.A.
- Copeia, Lawrence, Kansas, U.S.A.
- Herpetologica, Lawrence, Kansas, U.S.A.
- Journal of Herpetology (J. Herp.), Ann Arbor, Michigan, U.S.A.
- Journal of the Bombay Natural History Society (J. Bombay Nat. Hist. Soc.), Bombay, India.
- Lingnan Science Journal (Lingnan Sci. J.), Canton, Republic of China.
- Natural History Bulletin of the Siam Society (Nat. Hist. Bull. Siam Soc.), Bangkok, Siam [Thailand].
- Philippine Journal of Science (Philip. J. Sci.), Manila, Philippines.
- Proceedings of the Academy of Natural Sciences of Philadelphia (Proc. Acad. Nat. Sci. Phila.), Philadelphia, Pennsylvania, U.S.A.
- Proceedings of the 8th American Scientific Congress (Proc. 8th Amer. Sci. Cong.), Washington, D.C., U.S.A.

- Proceedings of the Biological Society of Washington (Proc. Biol. Soc. Wash.), Washington, D.C., U.S.A.
- Proceedings of the New England Zoological Club (Proc. New England Zool. Club), Cambridge, Massachusetts, U.S.A.
- Proceedings of the 9th Pacific Science Congress (Proc. 9th Pacific Sci. Cong.), Bangkok, Thailand.
- Senckenbergiana Biologica (Senck. Biol.), Frankfurt-am-Main, Germany.
- Society for the Study of Amphibians and Reptiles—Facsimile Reprints in Herpetology, Ann Arbor, Michigan, U.S.A.
- Transactions of the Kansas Academy of Science (Trans. Kans. Acad. Sci.), Manhattan, Kansas, U.S.A.
- United States National Museum, Proceedings (Proc. U.S. Nat. Mus.), Washington, D.C., U.S.A.
- United States National Museum, Bulletin (U.S. Nat. Mus. Bull.), Washington, D.C., U.S.A.
- University of Kansas Publications, Museum of Natural History (Univ. Kans. Publ. Mus. Nat. Hist.), Lawrence, Kansas, U.S.A.
- University of Kansas Publications, State Geological Survey of Kansas (Univ. Kans. Publ. State Geol. Survey Kans.), Lawrence, Kansas, U.S.A.
- University of Kansas Science Bulletin (U.K.S.B.), Lawrence, Kansas, U.S.A.
- Washington Academy of Sciences Journal (J. Wash. Acad. Sci.), Washington, D.C., U.S.A.

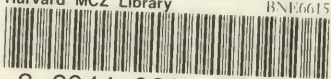
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